

NOTICE

All drawings located at the end of the document.

1a
**REMEDIAL ACTION, 881 HILLSIDE
 PHASE I CONSTRUCTION
 (BUILDING 891 FOUNDATION)**

SPECIFICATIONS AND DRAWINGS

PREPARED FOR

**ROCKWELL INTERNATIONAL
 AEROSPACE OPERATIONS
 ROCKY FLATS PLANT**

AUGUST 1989

PREPARED BY

ENGINEERING-SCIENCE, INC.
 Denver, Colorado

IN CONJUNCTION WITH

THE RALPH M. PARSONS COMPANY
 Pasadena, California

"REVIEWED FOR CLASSIFICATION

By TPBullb

Date 8/11/89"

REVIEWED FOR CLASSIFICATION/UCM

By TPBullb

Date 8/19/92

ADMIN RECORD

A-DU01-000393

SPECIFICATIONS AND DRAWINGS

FOR
PHASE I CONSTRUCTION
(BUILDING 891 FOUNDATION)

REMEDIAL ACTION 881 HILLSIDE, 881
ROCKY FLATS PLANT
GOLDEN, COLORADO

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By KF J. 01059
Date 5/9/92 (JNS)

TABLE OF CONTENTS

PART I SPECIFICATIONS

SECTION	TITLE	PAGE
01100	SPECIAL CONTRACT REQUIREMENTS	01100-1
01300	SUBMITTALS	01300-1
01500	TEMPORARY FACILITIES, CONTROLS, & SPECIAL PROJECT REQUIREMENTS	01500-1
02200	EARTHWORK	02200-1
03100	CONCRETE FORMWORK	03100-1
03200	CONCRETE REINFORCEMENT	03200-1
03300	CAST-IN-PLACE CONCRETE	03300-1
03600	GROUT	03600-1

PART II DRAWINGS

APPENDIX A PRESTON STEEL BUILDING COMPANY DETAILS

APPENDIX B QUALITY ACCEPTANCE CRITERIA CHECKLIST

PART I
SPECIFICATIONS

SECTION 01100
SPECIAL CONTRACT REQUIREMENTS

01101 LOCATION OF WORK

The work covered by this Contract will be performed at the Rocky Flats Plant, near Denver, Colorado. (See Area Plot Plan as shown on the Drawings.) This facility is one which is owned by the Government and operated on behalf of the DOE by Rockwell International.

01102 SCOPE OF WORK, PERFORMANCE OF WORK BY CONTRACTOR

This Contract covers the furnishing of all plant, labor, equipment, supplies, and materials and performing all work in strict accordance with the terms of the Contract.

The Contractor shall perform on the site and with his own organization work equivalent to at least 20 percent of the total dollar amount of work to be performed under the contract. If during the progress of the work hereunder, the Contractor requests a reduction in such percentage and the Buyer determines that it would be to the Buyer's advantage, he may, in writing, authorize a reduction.

01103 CONTRACT DRAWINGS AND SPECIFICATIONS

The Contractor will be furnished, without charge, 10 sets of Specifications and half-sized Drawings, one full-size set of Drawings, and one full-size reproducible set of Drawings. The Drawings which constitute a part of the Contract Documents are as indexed at the end of these Specifications.

01104 ABBREVIATIONS

Abbreviations contained in various sections of the specifications refer to the following organizations, societies, associations, standards, publications, terms, etc.

AASHTO	American Association of State Highway and Transportation Officials.
ACI	American Concrete Institute.
AGA	American Gas Association.
AGMA	American Gear Manufacturers Association.
AIMA	Acoustical and Insulating Materials Association.
AISC	American Institute of Steel Construction, Inc.
AISI	American Iron and Steel Institute.
AMCA	Air Moving and Conditioning Association, Inc.
ANSI	American National Standards Institute.
APA	American Plywood Association.
API	American Petroleum Institute.
ASCE	American Society of Civil Engineers.

ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers.
ASME	American Society of Mechanical Engineers.
ASTM	American Society for Testing and Materials.
AWI	Architectural Woodwork Institute.
AWPB	American Wood Preservers Bureau.
AWPI	American Wood Preservers Institute.
AWS	American Welding Society.
AWWA	American Water Works Association.
CBM	Certified Ballast Manufacturers.
CLFMI	Chain Link Fencing Manufacturers Institute.
CRSI	Concrete Reinforcing Steel Institute.
CS	Commercial Standard, US Department of Commerce.
ETL	Electrical Testing Laboratories.
Fed Spec	Federal Specification.
HI	Hydraulics Institute.
ICBO	International Conference of Building Officials.
IEEE	Institute of Electrical and Electronic Engineers.
IPCEA	Insulated Power Cable Engineers Association.
MIL-	Military Specification (leading symbol).
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry.
NAPF	National Association of Plastic Fabricators.
NEC	National Electric Code.
NEMA	National Electrical Manufacturers Association.
NFPA	National Fire Protection Association.
NSF	National Sanitation Foundation.
NWMA	National Woodwork Manufacturers Association.
OFCI	Owner-Furnished Contractor-Installed.
OFCR	Owner-Furnished Contractor-Relocated.
OSHA	Occupational Safety and Health Administration. U.S.Department of Labor, as defined in the General Conditions.
PCA	Portland Cement Association.
PDI	Plumbing and Drainage Institute.
PS	Product Standard, U.S. Department of Commerce.
SDI	Steel Deck Institute.
SJI	Steel Joist Institute.
SMACNA	Sheet Metal and Air-Conditioning Contractors. National Association.
SPR	Simplified Practice Recommendations, U.S. Department of Commerce.
UBC	Uniform Building Code.
UL	Underwriters' Laboratories, Inc.
WWPA	Western Wood Products Association.

01105 SECURITY MEASURES

- a. The Contractor shall furnish to the Buyer a letter listing all Contractor organizations; any deviations from the normal workday or workweek at the Rocky Flats Plant; names, dates of birth, height, color of eyes and hair, and citizenship status of Contractor and Subcontractor personnel who require access to specified construction areas. Access will be granted for the period of performance of work. The Buyer shall be notified of the termination of employment of individuals submitted for access. The Buyer reserves the right to exclude from the worksite any employee as deemed appropriate. Access to the plant site will not be granted to persons who are not citizens of the United States of America.
- b. The Buyer shall issue each Contractor individual security badges (passes) and parking permits for access to the plant. All badges and parking permits are accountable property of the U.S. Government and must be returned to the designated guard gate at the end of each day. Failure of the Contractor to return all badges and parking permits could result in a delay of contract closing.
- c. The work under this contract will be performed in security areas and employees will be subject to security controls required by the DOE. Contractor employees who possess a DOE personnel security clearance will be permitted access to the security areas under special controls. The Contractor shall arrange for access with the Buyer.
- d. No uncleared Contractor personnel will be permitted within security areas without security escorts. These escorts will be furnished at no cost to the Contractor; however, a one week advance notice of the Contractor's access requirements is necessary.
- e. The Contractor shall schedule his work so as to minimize the number of security escorts required.
- f. "Q" Access Authorization Requirements:

Personnel with "Q" access authorization is required for Building 881 and compound area inside the fence. Since none of the work under Phase I construction specified herein is inside the Building 881 fenced area, no "Q" clearance personnel should be required.
- g. All persons receiving access authorizations will be subjected to lectures, badging, and miscellaneous administrative actions, estimated to take approximately 4 hours per man. All costs for the time involved as a result of these actions shall be borne by the Contractor, whether it involves more or less time than estimated above. Termination procedures will

require approximately 15 minutes per man. All costs for the time involved will be borne by the Contractor.

01106 HEALTH SCIENCES MEASURES

- a. The work under this contract will be performed in areas subject to Rocky Flats Health, Safety and Environment (HS&E) rules and regulations. See the following applicable HS&E manual sections:

- 2.00 Operational Requirements
 - 2.04 Employees Working Along
 - 2.06 Red Tag Procedure
 - 2.08 Lock Out and Tagging
- 6.00 Permits
 - 6.01 Excavation Permit
- 7.00 Protection Equipment
 - 7.01 Eye Protection
 - 7.02 Safety Shoes
 - 7.03 Visitor Respiratory Requirements
- 8.00 Clothing Requirements
 - 8.01 Safe Work Apparel
- 9.00 Material Handling and Storage
 - 9.05 Handling and Storage of Flammable and Combustible Liquids for Fire Safety
- 12.00 Industrial Safety
 - 12.06 Accident Prevention Signs and Tags
- 14.00 Fire Safety
 - 14.02 Spray Painting Using Toxic, Flammable, and Combustible Materials
- 15.00 Electric Equipment
 - 15.02 Electrical Equipment
- 24.00 Contractor Analysis
 - 24.01 Safety Responsibilities for Construction Contractors

All persons requiring access to these areas will be subjected to lectures and administrative actions which are estimated to take approximately 3 hours per man. All costs for the time involved as a result of these actions shall be born by the Contractor, whether it involves more or less time than that estimated above.

b. Reimbursement for Equipment Retained by the Buyer:

1. Tools and equipment shall be monitored prior to being removed from construction areas.
2. Any tools or equipment which are determined by the Buyer to be unsuitable for future use after having been monitored by the Buyer's Radiation Monitoring personnel will be retained by and disposition made by the Buyer.
3. Reasonable compensation will be made for any tools or equipment which are retained by the Buyer. The Contractor shall immediately notify the Buyer in writing of the value which he places on the tools and/or equipment and the basis for such valuation.

c. Specific Requirements:

1. Protective clothing required for Contractor's nonworking supervisory personnel entering areas for short periods will be shoe covers, respirators, and dosimetry badges.
2. All persons required to wear protective clothing will be required to take a shower at the close of each work day in shower facilities provided by the Buyer. Towels and lockers will be furnished by the Buyer.
3. Food, beverages, and tobacco are not permitted in the construction areas of this project.
4. Radiation Monitoring coverage will be provided by the Buyer on an as-required basis.
5. In the event of a conflict between the HS&E Manual, OSHA and other plant requirements, contact the Construction Coordinator for direction.
6. The Contractor shall use CM&I for all contacts even though the HS&E Manual section may state otherwise except in the case of reporting an emergency.
7. The Contractor shall, prior to commencing site work under this contract, submit to the Buyer a descriptive outline of his safety program (including the operations of Sub-Contractors) accident prevention and fire protection.

01107 SEQUENCE OF CONSTRUCTION

The Contractor shall arrange his schedule such that, when work is started, it will proceed promptly and vigorously to completion. The Buyer may require the Contractor to show satisfactory proof that materials, equipment, workers, etc.,

are or will be available as require to complete the work without undue delay.

01108 HEALTH AND SAFETY

In addition to the aforementioned requirements under Section 01106, the following safety items will be emphasized and enforced:

a. Ladders:

1. No three-legged ladders will be allowed.
2. No wooden ladders will be allowed in any building.
3. Aluminum ladders will not be allowed for work in areas where there is electrical power equipment.
4. Industrial fiberglass ladders are preferred.

b. All contractors shall comply with NFPA 241 (Safeguarding Building Construction and Demolition Operations).

c. All workmen will be required to wear hard hats. All visitors to posted construction areas will be required to wear hard hats.

d. All compaction performed with vibratory equipment will be performed by workmen wearing approved foot protection devices.

e. All Contractor personnel will wear shirts, long pants, and shoes on the plant site.

f. A lift device known as the "Xtraman Hoist" or any lifting devices where, by design, the operator or any other person is used as the ballast or counterweight of the device is not to be used on construction projects at the Rocky Flats Plant.

g. Smoking restriction shall be as posted.

h. Safety meetings shall be held weekly.

01109 MEDICAL RADIOISOTOPE PROCEDURES ON CONTRACTOR PERSONNEL

All persons engaged in construction at the Rocky Flats Plant are required to report any diagnostic or therapeutic treatment with radioisotopes to the Buyer. Personnel should report prior to treatment, if possible, or immediately after such treatment when they return to work.

01110 MONTHLY EMPLOYMENT UTILIZATION REPORT

Contractors using crafts subject to Part I of the Colorado Statewide Plan and/or subject to mandatory goals and ranges of Part II should submit Form CC-257 (Monthly Employment Utilization Report) no later than the 20th day of each month to:

Denver Area Office Director
OFCCP/ESA
2500 Curtis Street - Suite 100
Denver, CO 80205

01112 PRIVATELY OWNED RADIO PAGERS

Security regulations do not allow the use of privately owned radio pagers at the Rocky Flats Plant except in areas designated as "controlled," such as the warehouse, maintenance shops, garage, etc. Pagers must also be left in privately owned vehicles when entering any area that is not a "controlled" area.

01113 HOLIDAY WORK CURTAILMENT

During the holiday periods covering the days from November 23, 1989, through November 26, 1989, and from December 25, 1989, through January 1, 1990, Construction Contractor activities will be suspended. Subcontractors shall plan their work accordingly. Access to the plant site during these time periods will be by special arrangement with the Buyer only.

END OF SECTION

SECTION 01300
SUBMITTALS

01301 GENERAL (Refer to GP-2)

- a. Shop Drawings, catalog data, equipment and material lists, elementary diagrams, wiring diagrams, installation instructions, maintenance manuals and instructions, and operation brochures shall be submitted for the items of equipment and materials in accordance with the coded legend herein within the time specified unless otherwise directed by the Buyer. If materials or equipment are required and are not specifically listed therein, the most closely related item listed will govern the type of submittals required. The submittal shall include a typewritten list showing each item and manufacturer for approval and shall be submitted concurrently with all equipment which forms a system or subsystem that must be reviewed simultaneously because of coordination requirements. These submittals shall be corrected to "as-built" conditions prior to the completion of the project and turned over to the Buyer. Catalogs for submittal shall have unrelated pages removed with capacities and specified parameters relating to the item or items clearly marked. The maintenance manuals and instructions shall indicate routine-type work defined by step-by-step instructions that should be performed to insure long life and proper operations; the recommended frequency of performance is also to be included. Instructions should include possible trouble spots with diagnosis and correction of each. These manuals shall be turned over to the Buyer at the completion of the project. The theory of operation brochures shall describe the function of each component or subassembly in block-diagram-type presentation to a degree that a mechanic will understand the product well enough to operate and maintain it. These brochures will be submitted to the Buyer at the completion of the project.
- b. The Contractor shall submit to the Buyer, for review, copies as required by the Buyer or descriptive submittals (as described in paragraph a., above) for all items he proposes to use in the project, complete, containing all required detailed information. After approval has been indicated on each copy by appropriate signature, stamp, and date, three or more copies will be retained by the Buyer and the balance will be returned to the Contractor.
- c. Approval of descriptive submittals will not relieve the Contractor of the responsibility for correcting any errors which may exist or for meeting requirements of the specifications. No partial submittals will be accepted.

- d. If required, samples and descriptive data shall be submitted within the time specified in these Specifications, or if no time is specified, within a reasonable time before use to permit inspection and testing; and shall be shipped prepaid and delivered as specified in these Specifications and shall be properly marked to show the name of the material, trade name of manufacturer, place of origin, name and location of work where the material represented by the sample is to be used, and name of Contractor submitting the sample. Samples not subject to destructive tests may be retained until completion of the work, but thereafter will be returned to the Contractor, if he so requested in writing, at his own expense. Failure of any samples to pass the specified requirements will be sufficient cause for refusal to consider further any samples from the same manufacturer whose materials failed to pass the tests. Written authorization of the Buyer is required for inclusion into the work of items proposed to be substituted in lieu of those specified or referenced. (See the clause of the General Provisions entitled "Materials and Workmanship.") The opinion of the Buyer relating to the equality of items shall be final. Any changes required in the details and dimensions indicated on the Drawings as a result of approved substitution shall be properly made, as approved by the Buyer and at the expense of the Contractor. If the Contractor fails to submit for approval the required data within the specified time in accordance with the preceding paragraph, the Buyer will select a complete line of materials and/or equipment. If the Contractor submits for inclusion in the work materials and/or equipment not in accordance with the specifications, the Buyer will have the right to reject them and select a full line of materials and/or equipment. The selection made by the Buyer will be final and binding and the items shall be furnished and installed by the Contractor without change in the contract price.
- e. This provision shall be deemed superseded to the extent of conflict, if any, between this provision and any provision in the technical sections of the Specifications.

01302 SPECIFIC REQUIREMENTS

- a. Descriptive submittals shall be made for the items of equipment and materials set forth in the following tables within 30 calendar days after receipt of Notice to Proceed. Submittals marked with an asterisk must be in reproducible form, the same size and scale as the Contract Drawings, or as directed. The Buyer will issue, upon request, 22-inch by 34-inch Mylar drafting media for the above work. Submit eight complete sets for each

submittal item, except fire equipment items. Submit ten complete sets for each fire equipment item. One reproducible set of drawings may be submitted in lieu of the multiple sets of drawings required with the above.

LEGEND

- a. Shop Drawings
 - b. Catalog Data
 - c. Equipment List
 - d. Material List
 - e. Elementary Diagrams and Wiring Diagrams
 - f. Installation Instructions
 - g. Maintenance Instructions
 - h. Operating Instructions
 - i. Samples, Colors
 - j. Certifications
 - k. Performance Curves
 - l. Design Data
 - m. Recommended Spare Parts Lists
 - n. Computations
- b. The Contractor shall submit all forms, data, information, certificates, schedules, etc., as required in other sections of the specifications. Omission of an item from the above tabulation does not relieve the Contractor from the responsibility for submitting the items required.

PART II: PRODUCTS - NOT USED

PART III: EXECUTION

3.1 SUBMITTAL-GENERAL REQUIREMENTS

The Contractor shall submit to the Buyer for its review and approval all Shop Drawings, samples, materials lists, equipment data, test plans, instruction manuals, record documents, manufacturers' equipment manuals, and other submittals required by the Contract Documents and herein, or subsequently required by Modifications. All such items required to be submitted for review shall be furnished by and at the expense of the Contractor and any work affected by them shall not proceed without such review. Submittals and their contents shall be properly prepared, identified, and transmitted as provided herein or as the Buyer may otherwise direct. Except for record documents, test plans, and instructional manuals for operation and maintenance, submittal shall be approved before the materials or equipment covered by the submittal is delivered to the site. The progress schedule required under General Conditions, Article 2 - Preliminary Matters, shall be coordinated to this requirement.

- A. Submittal Review Time: Not less than 30 days shall be allowed for the review of submittals, not including the time

necessary for delivery or mailing, and shall cause no delay in the work. Extension of the Contract time will not be granted because of the Contractor's failure to make timely and correctly prepared and presented submittals with allowance for the checking and review periods.

- B. Deviations: At the time of the submission, the Contractor shall give notice in writing in the submittal of any deviation from the requirements of the Contract Documents. The deviations shall be clearly indicated or described including all other changes required to correlate the work. The Contractor shall state in writing all variation in costs occasioned by the deviations and his assumption of the cost of all related changes if the deviation is approved. Requirements stated in Paragraph E below shall also apply.
- C. Method of Submittal: The Contractor shall deliver submittals by means of dated, signed, and sequence numbered transmittals on the Buyer provided forms, identifying as to initial or resubmitted status, and fully describing the submittal contents. Equipment which is specified in one section of the Specifications shall not be combined in a single submittal with equipment specified in other Sections of the Specifications. Submittals are not acceptable directly from Subcontractors, suppliers, or manufacturers. In each transmittal the Contractor shall state the Buyer's Project Number and name, name and address of Contractor, name and address of Subcontractor, Manufacturer, Supplier or Distributor as applicable, Plan Reference and Specification Section, Articles, and paragraphs to which the submittal pertains; accompanying data sheets, catalogs, and brochures shall be identified in the same manner. Where several types or models are contained in the literature the Contractor shall delete non-applicable portions or specifically indicate which portions are intended and applicable. Submittal transmittals shall fully index all items submitted.
1. Incomplete Submittals: Including those not correctly transmitted, not correctly titled and identified, or not bearing the contractor's review and approval stamp, will be returned to the Contractor without review.
 2. Interrelated Submittals: Except where the preparation of a submittal is dependent upon the approval of a prior submittal, all submittals pertaining to the same class or portion of the work shall be submitted simultaneously.
- D. Contractor's Review and Approval: Every submittal of Shop Drawings, samples, materials lists, equipment data, instruction manuals, and other submittals upon which the proper execution of the work is dependent shall bear the Contractor's review and approval stamp certifying that the Contractor (1) has reviewed, checked, and approved the submittal and has coordinated the contents with the

requirements of the work and the Contract Documents including related work, (2) has determined and verified all quantities, field measurements, field construction criteria, materials, equipment, catalog numbers, and similar data, or will do so, and (3) states the work covered by the submittal is recommended by the Contractor and the Contractor's guarantee will fully apply thereto. The Contractor's stamp shall be dated and signed by the Contractor in every case.

- E. Review and Approval: Submittals will be reviewed only for conformance with the design concept of the Project and with the information given in the Contract Documents. The approval of a separate item as such will not indicate approval of the assembly in which the item functions nor shall approval be construed as revising, if any way, the requirements for a fully integrated and operable system as specified. The approval of submittals shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents or for any revision in resubmittals unless the Contractor has given notice in writing of the deviation or revision at the time of submission or resubmission and written approval has been given to the specific deviation or revision, nor shall any approval relieve the Contractor of responsibility for errors or omissions in the submittals or for the accuracy of dimensions and quantities, the adequacy of connections, and the proper and acceptable fitting, execution, and completion of the work.
- F. Corrections and Resubmittals: The Contractor shall make all required corrections and shall resubmit the required number of corrected submittals until approved on a Buyer provided form. The Contractor shall direct specific attention in writing to revisions other than the corrections called for on previous submittals, and shall state in writing all variations in costs and his assumption of the cost of related changes the same as is required for deviations in 3.1B. Identify each resubmittal with number of the original submittal followed by consecutive letters starting with "A" for first resubmitted, "B" for second resubmitted, etc. The Buyer reserves the right to deduct moneys from the amounts due to Contractor to cover the cost of its review time beyond the second submission.
- G. Check of Returned Submittals: The Contractor shall check submittals returned to him for correction and ascertain if the corrections result in extra cost to him above that included under the Contract Documents, and shall give written notice to the Buyer within five days if, in his opinion, such extra cost results from corrections. By failing to so notify the Buyer or by starting any work covered by a submittal, the Contractor waives all claims for extra costs resulting from required corrections.
- H. Conformance: No work represented by required submittals shall be purchased or commenced until the applicable submittal

has been approved. Work shall conform to the approved submittals and all other requirements of the Contract Documents unless subsequently revised by an appropriate modification, in which case the Contractor shall prepare and submit revised submittals as may be required. The Contractor shall not proceed with any related work which may be affected by the work covered under submittals until the applicable submittals have been approved, particularly where piping, machinery, equipment, concrete work and the required arrangements, embedments, and clearances are involved.

- I. Piecemeal Submittals: Except for reinforcing steel submittals, piecemeal submittals will be returned unreviewed. However, for mechanical equipment and the like, separate submittals for embedded items, embedded metal work and anchors will be reviewed.

3.2 SCHEDULE

A Gantt Chart Schedule for construction activities shall be submitted by the Contractor indicating key dates for major construction activities.

3.3 SHOP DRAWINGS

Each submittal shall be complete with respect to dimensions, design criteria, materials, connections, bases, foundations, anchors, and the like, and shall be accompanied by technical and performance data as necessary to fully illustrate conformance with the Contract Documents. Unless otherwise specified, each submittal shall include one set of reproducible copies or two sets of black-line printed copies. The printed copies, one for Buyer and one for its Engineer, shall be submitted folded to 8-1/2 in. x 11 in. size. The reproducible set will be returned to the Contractor marked to show the required corrections or approval. For catalogue cuts and the like which are 8-1/2 x 11 inch format provide no less than four (4) copies of which three will be retained by the Buyer and its Consultant.

- A. Title Block and Identification: On each Shop Drawing, provide a space for the Consultant's approval or correction stamp and a title block showing the following:

1. Name and address of Contractor.
2. Name and address of Subcontractor, manufacturer, supplier, or distributor, as applicable.
3. Name and address of Buyer.
4. Date, scale of Drawings, and identification number.
5. Contractor's review and approval stamp.
6. Buyer's number.
7. Plan reference and specification section reference.
8. Project name.

- B. Preparation and Size: Details and information shall be clearly drawn, dimensioned, noted, and cross referenced. Unless otherwise approved, prepare Shop Drawings of the same size as the Contract Drawings or on 8-1/2 by 11 inch sheets as applicable.
- C. Data: Unless the following data is included in instruction manuals or equipment data submitted prior to or with the Shop Drawings, submit with the Shop Drawings complete catalog and technical data for all manufactured products, materials, machinery, and equipment covered by the Shop Drawing submittal. Include data showing for each item, as applicable, the following information:
1. Manufacturer's specifications and details.
 2. Applicable technical data and performance curves.
 3. Preparation, assembly, and installation instruction with allowable tolerances.
 4. Connection requirements.
 5. Pre-startup servicing and operating methods.
 6. Other data and information necessary to demonstrate that the proposed items conform to the Contract Documents.
- D. Information Required: Shop Drawings shall contain details and information fully developing the pertaining Contract Document requirements and such other information as may be specified or required for approval, including but not limited to:
1. Related work with cross references to applicable portions of the Contract Documents.
 2. Dimensions including variations between indicated dimensions and actual conditions.
 3. Physical configurations with critical dimensions for clearance, access, and servicing.
 4. List of materials including fasteners and connectors.
 5. Structural construction and assemblies, welds shown by AWS symbols, and each fastener and connector shown on type and class.
 6. Grouting work, including grouting space and material.
 7. Concrete foundations and bases for machinery and equipment including joints, joint filler and sealer, and reinforcing.
 8. Anchor bolt details showing type and class, sizes, embedments, projections, and locations measured with respect to permanent structural features. An anchor bolt template shall be shown on the Shop Drawings and shall be furnished unless waived in writing by the Buyer.
 9. Protective coatings and factory finishes fully described as to materials, number of coats, plated and metallic coating finishes, treatments, and similar information, all based on specified requirements. The term "as specified" is not acceptable for this purpose.

10. Machinery and equipment details. Standard catalog items need not be illustrated in detail, but indicate and detail sizes, supports, and connections.
 11. Location of auxiliary items that are parts of machinery and equipment included sight glasses, petcocks, gages, lubrication fittings and access, and maintenance monitoring devices.
 12. Piping systems and piping including layout, fittings, valves, appurtenances, hangers and supports, and sleeves.
 13. Electrical equipment showing plans, elevations, sections, arrangements, materials, anchor bolts, supports, weights, wiring and circuit diagrams, internal connections, busses, grounding, conduit spaces, layout of instruments, gages, meters, and other components.
 14. Written descriptions fully describing the operation of all control circuits, start-up sequencing, shut down sequencing and alarms.
 15. Underground duct banks showing typical details of conduits, joints, spacers, and means of securing conduits in place during concrete placement.
 16. Dielectric connections, and materials and methods to be used to isolate aluminum from dissimilar materials.
 17. Full-size lettering layouts for data plate and nameplate inscriptions.
- E. Details and Connections: Satisfactorily detail all connections required to complete the work, including details necessary to make indicated or specified additions to existing work or to provide connections for future work. Design connections and parts of strength to withstand, without adverse deflection or stress, all loads or pressures to which they may be subjected and to develop the strength of the members or parts connected. In no case shall the connections, parts, or details be inferior to those required by the Contract Documents.
- F. Related Work: The term "by others" is not acceptable for the description of related work shown in the Shop Drawings. Clearly note by name or description the Contractor, Subcontractor, or trade to provide such related work; where such name or description is missing, it shall be understood and agreed that the Contractor is to furnish and install such related work.
- G. Clearances: Do not proceed with any related work that may be affected by piping, machinery, equipment, or other work therein until Shop Drawings and data showing all components with acceptable clearances have been approved.
- H. Composite Shop Drawings With Installation Layouts: Prepare and submit Drawings, wherever specified or required, to resolve tight or conflicting field conditions. Show dimensional plans and elevations of the materials or equipment of all trades in the involved area or space, and include

complete information as to arrangements, locations, clearances, avoidance of interferences, access, sizes, supports, connections, services, assembly, disassembly, and installation. Composite Shop Drawings and layouts shall be coordinated in the field by the Contractor and his Subcontractors for proper relationship to the work of all trades, based on field conditions, and shall be checked and approved by them before submittal. Contractor shall have competent technical personnel readily available for such coordinating and checking.

3.4 SAMPLES

Unless otherwise specified, each submittal shall include two sets of samples. One set of approved samples and all disapproved samples will be returned to the Contractor. Samples of value retained by the Buyer will be returned to the Contractor after completion of the work if the Contractor's first transmittal of the sample requests its return. Approved samples of manufactured items returned to the Contractor may be installed in the work if the location is recorded and the samples bear temporary identification as such.

- A. Identification: Label or tag each sample or set of samples identifying the manufacturer's name and address, brand name, catalog number, intended use and other data specified in Article 3.1C herein.
- B. Colors, Patterns, and Textures: For items required to be of selected and approved colors, patterns, textures, or other finish, submit sufficient samples to show the range of shades, tones, values, patterns, textures, or other features corresponding to the instructions and requirements specified.
- C. Field-Applied Paint and Coatings: Submit samples of finishes at least 60 days prior to start of such finishing operations in conformance with requirements specified in Section 09900, Painting.
- D. Factory Finish Colors: Colors of material specified to be furnished with a factory finish are subject to approval. Submit duplicate samples of factory finishes showing the full range of available colors for selection and approval when requested by the Buyer.

3.5 MATERIALS LISTS AND EQUIPMENT DATA

Materials lists and equipment data shall be submitted for all items proposed to be incorporated into the work. In determining acceptability, consideration will be given to the availability of maintenance and replacement parts and materials, the availability of manufacturer's technical representatives, other factors that related to the maintenance and repair of installed items without

excessive inconvenience to the Buyer, guarantees and warranties, as well as determination of conformance with the Contract Documents.

- A. **Materials Furnished Under Standard Specifications:** For materials specified by reference to standard or reference Specifications, the Contractor shall prepare and submit for approval a list of such materials by manufacturer's names and identifications to the extent requested by the Buyer.
- B. **Material Lists:** Submittal copies shall be neatly bound with sturdy labeled covers. Copies shall contain an index listing the contents. Loose submittals will be returned unreviewed. For each item listed, the Contractor shall include the manufacturer's name and address, trade or brand name, local supplier's name and address, catalog numbers and cuts, brochures, terms and conditions of manufacturer's guarantee and warranty, other information to fully describe the item, and supplementary information as may be required for approval. Cuts, brochures, and data shall be marked to indicate the items proposed and the intended use. Unless otherwise specified, each submittal shall include not less than four bound copies, three of which will be retained by the Buyer and its Consultant and the rest of which will be returned to the Contractor marked to show the required corrections or approval.
- C. **Equipment Data:** The Contractor shall submit complete technical and catalog data for every item of mechanical and electrical equipment and machinery to be incorporated in the work, including components. Submittal copies shall be bound, indexed, and contain information as required in paragraph 3.5B for submittal of materials lists and shall further include specific information on performance and operating curves and data, ratings, capacities, characteristics, efficiencies, and other data to fully illustrate and describe the items as may be specified or required for approval, in particular, equipment incorporating logic circuits shall have a draft of a detailed theory of operation. Data shall be submitted in sets covering complete systems or functioning units. Unless otherwise specified, each submittal shall include not less than four bound copies, three of which will be retained by the Buyer and its Consultant and the rest of which will be returned to the Contractor marked to show the required corrections or approval.

3.6 INSTRUCTION MANUALS

The Contractor shall obtain data from the various manufacturers and submit instruction (operation and maintenance) manuals covering all mechanical equipment and machinery installed in the work.

- A. **Contents:** Each manual shall have an index listing the contents. Information in the manuals shall include not less than (1) general, introduction and overall equipment

description, purpose, functions, and simplified theory of operation, (2) specifications, (3) installation instructions, procedures, sequences, and precautions, including tolerances for level, horizontal, and vertical alignment, (4) grouting requirements including grout spaces and materials, (5) list showing lubricants for each items of mechanical equipment, approximate quantities needed per year, and recommended lubrication intervals; where possible, types of lubricants shall be consolidated with equipment manufacturers' approval to minimize the number of different lubricants required for plant maintenance, (6) startup and beginning operation procedures, (7) operational procedures, (8) shut down procedures, (9) short- and long-term inactivation procedures, (10) maintenance, calibration, and repair instruction, (11) parts lists and spare parts recommendations, (12) lists of all special tools, instruments, accessories, and special lifting and handling devices required for periodic maintenance, repair, adjustment, and calibration, (13) wiring diagrams and detailed circuit operation description, (14) performance curves and data and (15) other information as may be specified or required for approval.

B. Format and Organization:

1. Use drawings and pictorials to illustrate the printed text as necessary to fully present the information.
2. Where information covers a family of similar items of equipment, identify the applicable portions by heavy weighted arrows, boxes or circles, or strike-out the inapplicable information. Non-conforming data are not acceptable and will be returned for rework and resubmitted.
3. Contractor shall incorporate into books all Manufacturers' Equipment Manuals including those specified in pertinent sections of the Specifications. These books shall be organized by Equipment Class in same manner and sequence as the specifications, i.e. Mechanical, Electrical, Instrumentation, etc. Book size and quantity shall be sufficient for inclusion of all data, and be of type and quality hereinafter specified in Article 3.6C.
4. Within each book of manuals, provide a Table of Contents for that book. If more than one book is necessary for a Class of Equipment, place a complete Table of Contents for that Class of Equipment within each book of that Class.
5. In addition, an overall Index of Contents shall be prepared in ten sets and submitted separately to the Buyer for his insertion in the Operation and Maintenance Manuals.

6. When a manufacturer's manual exceeds one inch in thickness and is bound as specified in Paragraph 3.6C it need not be rebound within another book, but the Overall Index shall refer to it by title and indicate that it is bound separately.

C. Manual Binding:

1. Bind all books in sturdy hard covers fastened to provide full view of contents on each page, and ease of making content additions or replacements. No book shall be more than four inches thick. Manuals less than one inch thick shall be bound in substantial three-ring loose leaf binders; others shall have rigid covers secured by operable locking-bars to permit full view opening with contents bound by hinged interfacing pairs of three-ring binding posts, as manufactured by McBee, Springfield, MO., or Inter-City, St. Louis, MO., Wilson Jones, or equal.
2. Permanently label face of cover and bound edge of each book "MANUFACTURERS' INSTRUCTION MANUAL," and indicate Class of Equipment, i.e., Mechanical, Electrical, Instrumentation, etc. or name specific equipment if a single unit is contained. Where more than one book is needed for a Class of Equipment or a single specific equipment unit, number books consecutively BOOK I, BOOK II, etc.
3. If more than one Class of Equipment is contained in a book, separate each class with a tabbed stiff divider insert page.
4. Prior to purchase or delivery, submit samples of each intended type of binder and obtain approval from the Buyer.

- D. Manual Submittals: Submittals shall include two copies of each manual, one of which will be returned to the Contractor marked to show the required corrections or approval. When approved, the Contractor shall deliver ten copies to the Buyer unless otherwise specified.

3.7 INSTALLATION INSTRUCTIONS

In addition to the instructions submitted under Article 3.6, the Contractor shall submit two copies of manufacturers' installation instructions for material and equipment incorporated in the work to the extent specified in other Sections and Divisions of the Specifications or requested by the Buyer for its review. Installation instructions will be reviewed for general adequacy only. After review, the Contractor shall distribute copies to all those involved with the instructions.

3.8 OTHER SUBMITTALS

Provide no less than four copies of other submittals such as calculations, manufacturer's certified reports, operational demonstration and system validation reports specified in other Sections and Divisions of the Specifications three of which will be retained by the Buyer and its Consultant and the rest of which will be returned to the Contractor marked to show the required corrections.

3.9 FORM OF APPROVAL

- A. Copies of submittals which are returned to the Contractor and which are subject to approval will be marked with notations (a), (b), (c), or (d), and may also be marked with notation (e), in which case the action so indicated shall be taken by the Contractor.
 - (a) Approved subject to the Contract Requirements.
 - (b) Approved subject to changes shown and to the Contract requirements.
 - (c) Disapproved pending completion of corrections noted.
 - (d) Returned without complete review - incomplete submittal not in accordance with Contract Requirements.
 - (e) Special direction or comments.
- B. Returned copies of drawings marked with either notation (a) or (b) authorize Contractor to proceed with the fabrication, installation or construction, or any combination thereof, covered by such returned drawings, provided, that such fabrication, installation or construction shall be subject to the comments, if any, shown on such returned copies. Although fabrication may proceed on a notation (b), Contractor shall incorporate the comments, resubmit, and obtain notation (a) before release for shipment can be granted.
- C. Returned copies of drawings marked with notation (c) or (d) shall be corrected as necessary and revised drawings shall be submitted in the same manner as before.
- D. Returned copies of drawings marked with either notation (c), (d), or (e) shall be resubmitted not later than 10 days after date of transmittal by Buyer of such copies of such drawings.

3.10 TOOLS, ACCESSORIES, SPARE PARTS, AND MAINTENANCE MATERIALS

The Contractor shall furnish and deliver all special tools, instruments, accessories, spare parts, and maintenance materials required by the Contract documents, and shall furnish and deliver the special tools, instruments, accessories, and special lifting and handling devices shown in the instruction manuals approved under Article 3.6. Unless otherwise specified or directed, the items shall be delivered to the Buyer, with the Contractor's written

transmittal accompanying each shipment, in the manufacturers' original containers labeled to described the contents and the equipment for which it is furnished. Where specifically required in the Section covering the material the Contractor shall furnish a metal cabinet to house this equipment.

3.11 RECORD DRAWINGS AND SPECIFICATIONS

The Contractor shall maintain one record copy of all Drawings, Specifications, addenda, modifications, approved submittals, correspondence, and transmittals at the site in good order and readily available to the Buyer. The record Drawings shall be clearly and correctly marked and the record Specifications annotated by the Contractor to show all changes made during the construction process at the time the changed work is installed. No such changes shall be made in the work unless previously authorized by a modification or by specific approval of deviations or revisions in submittals.

- A. Buried and Concealed Work: The Contractor shall record the precise location of all piping, conduits, ducts, cables, and like work that is buried, embedded in concrete or masonry, or concealed in wood or metal framed walls and structures at the time such work is installed and prior to concealment. Each feature of the concealed work, such as the beginning and end of straight runs, radius center point of curved runs, angles, connections, plugged tees or other fittings for future connections, and like items shall be accurately located but not less than two dimensions to permanent structures. The depth below finish grade, slab, or paving shall be noted for buried pipe, conduit, or ducts at the beginning and end of straight grade runs and at all grade change points, excepting sewer or drain lines between manholes. Should the Contractor fail to record such buried or concealed work, he shall uncover the unrecorded work to the extent required by the Buyer and shall satisfactorily restore and reconstruct the removed work with no change in the Contract Price or the Contract Time.
- B. Delivery: Upon completion and prior to final inspection of the work, and as a condition of final payment, the Contractor shall submit the record Drawings and Specifications to the Buyer for review, and shall make such revisions or corrections as may be necessary for them to be a true, complete, and accurate record of the work in the opinion of the Buyer. When approved, the Contractor shall deliver the record Drawings and Specifications to the Buyer.

3.12 REVISION OF SUBMITTALS

Whenever a modification causes a change to the information contained in previously approved submittals, the Contractor shall submit information and data corresponding to the changed requirements for approval. After completion of the operational test required in Section 01005, General Mechanical and Equipment

Provisions, the Contractor shall submit revised or additional information and data for the instruction manuals and equipment data as the buyer may require. Revision submittals shall be submitted following the procedures required for previously approved submittals.

END OF SECTION

SECTION 01500
TEMPORARY FACILITIES, CONTROLS,
AND SPECIAL PROJECT REQUIREMENTS

01501 FIRE PROTECTION SYSTEMS

Fire protection systems are not included in Phase I Construction. The Contractor shall be responsible for fire protection for his own vehicles, facilities and equipment.

01502 TEMPORARY FIELD OFFICE

The Contractor will not be required to furnish and maintain field office facilities for the Buyer; however, he shall provide for his own field office requirements if needed.

When a Contractor provides a temporary office or storage facility which is either a trailer or a portable building, it will be located as directed by the Buyer, and be secured in accordance with the Standard for Trailer Anchorage on Rockwell Std. No. SC103.

01504 AVAILABILITY OF UTILITIES AND SERVICES (Refer to GP-19)

- a. Water to complete construction of this contract work will be made available to the Contractor at the nearest building as designated by the Buyer. Temporary power for construction shall be at a location within 200 feet of the construction site as directed by the Buyer.
- b. Personal cars of the Contractor's employees must remain parked at an area designated by the Buyer throughout the working day. Only the Contractor's working vehicles will be permitted to be driven on the work site except before starting time and after quitting time.
- c. The Contractor shall furnish toilet facilities for his personnel.
- d. All 120-volt, single-phase, 15-and 20-ampere receptacle outlets, serving tools, or equipment being used outside of buildings shall be equipped with ground-fault circuit interrupters. Such interrupters shall be furnished by the Contractor. This requirement will be strictly enforced.

01505 SALVAGE AND DISPOSAL OF REMOVED MATERIALS (Refer to GP-21)

- a. Posted dumping grounds on the plant site which have been designated by the Buyer shall be the only areas used as dumping areas for waste materials unless written permission is obtained from the Buyer for disposal at other locations.
- b. The Contractor is encouraged to use returnable containers and packages for all materials and supplies delivered to the

jobsite. The Contractor shall limit, as much as possible, the amount of waste accumulated during construction.

- c. The Buyer will furnish lockable boxes to the construction site for the disposal of materials that are determined to emit radionuclides. The Contractor shall place materials so designated in these boxes. Waste boxes will be kept locked and stored inside buildings.
- d. The Contractor shall, at all times, keep the work area clean and orderly. All debris, scrap, and rubble shall be removed from the work area as they are created. At the end of each work shift, the work area shall be swept clean and left in a neat and orderly manner. Access routes for other personnel must be kept clear at all times.
- e. Installed equipment and materials removed by the Contractor under this contract, and not authorized to be reused in the work, shall remain the property of the Buyer. All such equipment and material shall be properly identified and delivered in the Buyer as directed by the Buyer. The Contractor shall use care in removing salvageable materials and equipment so as not to cause undue damage that may render the equipment or materials unusable.

01506 CONCRETE TRUCK WASHOUT

Concrete truck washout will be permitted at the Rocky Flats landfill in a location designated by the Buyer.

01507 TESTING (Refer to GP-25)

- a. If it is provided in the technical sections that a test is to be performed at Buyer expense, costs of any such test which reveals that the Contract requirements have not been met will be paid by the Contractor and not the Buyer.
- b. The Contractor shall cooperate with the Buyer and any testing organization selected by the Buyer in the preparation for the performance of any test to be conducted by the Buyer or any testing organization selected by the Buyer.

01508 WORK PERMITS

At least one week prior to the start of any excavation or welding, the Contractor shall request the appropriate work permit from the Buyer. These permits are issued as a matter of course. For excavations involving installation of buried utilities including electrical and alarm systems, metallic-coated plastic detector tape will be issued as GFE to the Contractor to be installed approximately 12 inches directly above the buried utility or as directed by the Buyer.

01509 UTILITY OUTAGES

The Contractor shall furnish the Buyer 48 hours advance notice of any planned utility outage.

01510 SPECIAL CONTROLS

- a. Noise Control: Comply with OSHA requirements as to allowable noise levels during construction. Equip all internal combustion engines in vehicles and construction equipment with effective mufflers. Prevent noise disturbance to adjoining property owners and the public.
- b. Dust Control: Sprinkle streets and places where construction operations create a dust nuisance at frequent intervals and not less than twice daily. Be responsible for all damage resulting from dust produced by construction operations.
- c. Water Control: Perform grading and other operations to maintain site drainage. Do not allow surface water to accumulate in excavations, under structures, or in ponds on the site and control surface water by means of ditches, dams, temporary pumps and piping, and other necessary methods. Legally dispose of surface and subsurface water and do not allow mud, silt, or debris to flow on to adjoining or public property.
- d. Air Pollution Control: Comply with all laws, ordinances, rules, regulations, and other restrictions pertaining to air pollution. Do not use any fuel nor perform any operation that emits smoke which is defined as equal to Ringleman No. 2 or darker.
- e. Temporary Heating: Furnish and pay for heat, fuel, and services to protect the Work against injury from dampness and cold until final acceptance, and to maintain correct temperatures and ventilation in buildings before finish lumber and millwork are delivered, and throughout placing of finish and other finishing operations such as painting and installation of resilient coverings.
 1. Temporary Heating Equipment: Use equipment that produces no combustion gases or that discharges such gases directly to the exterior atmosphere by ducts, tubes, or similar conduits.
 2. Permanent Systems: Building heating and ventilating systems may be used. Furnish a competent engineer to operate systems and be solely responsible for damage to equipment during such temporary operation. Operate systems as necessary to maintain correct temperatures and ventilation within buildings during finishing operations. During temporary heating and ventilating

equip systems with temporary throwaway type filters to prevent dust entering supply systems. Be responsible for delivering systems free of dust and lint at time of final acceptance.

01511 SANITARY FACILITIES

- a. Toilet and Washing Facilities: Provide temporary chemical toilets and fresh water washing facilities for the use of all workmen at the site. Supply paper, soap, and towels, and maintain the facilities in a clean and sanitary condition. Pit type privies are not permitted.
- b. Drinking Water: Maintain a supply of cool pure drinking water at the site, readily available to workmen, with individual disposal drinking cups or a sanitary bubbler fountain.

01512 REMOVAL OF TEMPORARY FACILITIES AND CONTROLS

Remove temporary facilities and controls from the site and where the Work is performed when no longer required in the Buyer's opinion. Clean up and restore areas occupied by temporary facilities to acceptable condition.

END OF SECTION

SECTION 02200

EARTHWORK

PART I: GENERAL

1.1 APPROVAL: Prior to starting any excavations, an approved excavation permit and written permission shall be obtained from the Buyer.

1.2 PROTECTION AND SAFETY:

A. Traffic Control:

1. Keep all roads, sidewalks, and parking areas which are not part of this project usable at all times.
2. The Buyer shall provide all necessary barricades, lights, signals, etc., for the protection of the workers and the public, as established by the Occupational Safety and Health Administration (OSHA) Construction Safety and Health Regulation 29 CFR, Part 1926, Subpart G, Signs, Signals, and Barricades.

B. Excavations, Trenching, and Shoring:

1. All excavations, trenching, and shoring shall comply with the rules and regulations as established by OSHA Construction Safety and Health Regulations 29 CFR, Part 1926, Subpart P, Excavation, Trenching, and Shoring.
2. OSHA Pamphlet 2226, Excavation and Trenching Operations, can be used as an additional aid.
3. Spoil from excavations shall be placed a minimum of four feet to the outside of the excavation lip to allow a clear area for rescue equipment.

1.3 EXISTING UTILITIES:

- A. Notify the Buyer immediately when existing utilities are encountered during excavation.
- B. Obtain approval from the Buyer before backfilling existing utilities.

1.4 SITE PREPARATION

- A. The immediate area of the construction site shall be cleared and grubbed. Cleared and grubbed material shall be disposed of at a location at the Rocky Flats Plant designated by the Buyer.

- B. The construction site shall be graded as shown on the Drawings. Site grading shall take place such that no surface drainage from the surrounding area flows onto the construction site. Small earthen berms or swales shall be constructed as required for this purpose. The intent of the site preparation grading is to minimize the amount of water removed during excavation and construction.
 - C. The limits of the construction site to be cleared, grubbed and graded will be marked by survey stakes by the Buyer.
- 1.5 SITE LOCATION: The building corners for Building 891 have been surveyed and staked at the construction site. It is the responsibility of the Contractor to locate the foundation from these survey stakes.

PART II: PRODUCTS

2.1 GENERAL:

- A. Material to be excavated or cleared is assumed to be earth, claystone, and other materials that can be removed with a power shovel.
- B. If rock, other than claystone, is encountered within the limits of excavation, notify the Buyer immediately and do not proceed except as instructed.

2.2 FILL MATERIALS:

- A. Fill material for structures and utility trenches shall be granular soils free of organic matter.
- B. Sand fill shall pass a 20-mesh and be retained on a 200-mesh U.S. Standard sieve and shall be free of organic material, trash, and debris.
- C. Class I Structural Fill: Suitable excavated material containing no stones having a diameter greater than 3 in.
- D. Class II Structural Fill: Suitable excavated material containing no stones having a diameter greater than 6 in.
- E. Pipeline Embedment Material: This material shall consist of sand fill.
- F. Water, Gas, and Underground Conduit Embedment Material: This material shall be sand fill.
- G. Frozen materials shall not be used for fill.
- H. All suitable material removed from the excavation shall be used in forming fills. No excavated material shall be wasted without approval of the Buyer.

- I. Fill for storage areas and roads shall consist of overburden and bedrock materials, including broken asphalt pavement, obtained from excavated areas.
- J. Drain Rock: This material shall consist of 3/4 inch washed and cleaned crushed stone.
- K. Top Soil: Material within 1 foot of the surface. This material is not suitable for support of structural loads or use as backfill.

2.3 WARNING TAPE: Furnished by Buyer and installed by Contractor.

2.4 STRUCTURAL FILL:

- A. Structural Fill shall consist of select granular material, either imported or manufactured from excavated on-site rocky materials.

1. The select granular material can be import coarse sand, import "DG" (decomposed granite) or a processed material derived from the on-site excavation. The gradation for select granular soil should fall within the following limits:

<u>Sieve Size</u>	<u>% Finer</u>
3/4	100
No. 4	80 - 100
No. 30	46 - 70
No. 100	6 - 40
No. 200	0 - 20

2. All material shall be of a quality as specified in Subsection 200-1.1 of Section 200 Rock Materials in the Standard Specification for Public Works Construction, 1985 Edition.

3. Structural Fill shall conform to the following:.

- (1) Classification - ASTM D2487
- (2) Atterberg Limits - ASTM D4318
- (3) Compaction - Standard Proctor ASTM D698
- (4) Physical Properties - ASTM D854, D2216.

PART III: EXECUTION

3.1 GENERAL:

- A. The worksite and areas shown on the drawings shall be cleared of all natural obstructions and existing foundations, pavement, utility lines, and other items which will interfere with the construction operations, as approved by the Buyer.
- B. Proper allowances shall be made for form construction, waterproofing, shoring, and inspection. Where walls or footings are authorized to be deposited directly against excavated surfaces, the surfaces shall be sharp, clean, and true. Bottoms of excavations for footings, piers, grade beams, etc., shall be level, clean, and clear of loose materials.
- C. Protect bottoms of all excavations from free-standing water and frost. Foundations, footings, grade beams, or slabs shall not be placed on wet or frozen ground.
- D. Suitable excavated material which is required for fill under slabs shall be separately stockpiled as directed by the Buyer.
- E. All excavated materials will be tested by the Buyer's Health Physics representative. Any excavated materials exceeding the criteria for placement as fill shall be immediately segregated from other uncontaminated materials and placed in containers provided by the Buyer. The Buyer shall arrange for removal and disposal of these containers.

Rubble, debris, and excess material which passes these tests will be disposed of as directed in item 3.10 of this Section.

- F. All excavated materials shall be handled in such a manner to minimize contaminant dispersion via aeolian dispersion or leaching. No excavated materials shall be transported or stored downgradient of the proposed French drain and shall be placed as a surface wall in the area of known contamination. Prior to excavation, soils shall be wetted to a moisture content exceeding optimum moisture as defined by Standard Proctor Compaction Testing, ASTM D-698. In general, during handling, the excavated materials shall be thoroughly wetted but shall not contain moisture to the extent which will interfere with the Contractor's handling equipment. Excavated materials in stockpiles shall be immediately stabilized by covering or other approved means immediately upon conclusion of work at that particular stockpile. During final placement of waste excavation, add such covering as may be necessary so that aeolian dispersion is minimized. No earthwork shall be permitted during periods in which the wind velocity exceeds 30 mph. Long-term erosion protection shall be provided by seeding and irrigation as required or by other means approved by the Buyer. Irrigation shall not begin until after the

French drain and treatment unit are functional. Earthwork operations shall be planned and conducted in a manner to promote maximum handling efficiency. Materials shall be immediately placed and compacted after initial excavation where practicable.

- 3.2 TOPSOIL REMOVAL: The topsoil from all areas to be excavated shall be tested according to item 3.1E of this Section. Acceptable topsoil shall be removed and stockpiled as per item 3.1F of this section for later use in reclaiming the excavated areas.

3.3 TRENCHING:

- A. Trenching for utility systems shall be of sufficient width for proper laying of pipe and conduit. The trench banks shall be as nearly vertical as is practical. Undercutting will not be permitted. Trenches shall be of sufficient depth to provide not less than the minimum cover shown on the Drawings or 3 feet, whichever is greater.
- B. Temporary trench excavations shall at all times conform to the safety requirements as specified in items 1.2.B.1 and 2 of this Section.
- C. The minimum width of pipe trenches, measured at the crown of the pipe, shall not be less than 12-inches (30.48 cm) greater than the exterior diameter of the pipe, exclusive of bells and the minimum base width of such trench shall be not less than 12-inches (30.48 cm) greater than the exterior diameter of the pipe, exclusive of special structures or connections, and such minimum width shall be exclusive of all trench supports.
- D. The maximum allowable width of trench for all pipelines measured at the crown of the pipe shall be the outside diameter of the pipe (exclusive of bells or collars) plus 24-inches (60.96 cm), and such maximum shall be inclusive of all timbers. Excavation wider than the above specifications is allowed for the trench above the top of the pipe. Below the top of the pipe, a trench wider than the outside diameter plus 24-inches (60.96 cm) may be used without special bedding if the Contractor, at his expense will furnish pipe of the required strength to carry the additional trench load. Such modifications shall be submitted to the Buyer and approved in writing. When ever such maximum allowable width of trench is exceeded for any reason, except as provided for on the Plans or in the Specifications, or by the written direction of the Buyer, the Buyer may, at his discretion, require that the Contractor, at his own expense for all labor and materials, cradle the pipe in 2500 psi (175.77 Kg/cm²) compressive strength concrete, or other approved pipe bedding.
- E. Except by special permission by the Buyer, only that amount of pipe construction will be permitted, including excavation,

construction of pipeline, and backfill in any one location, which can be completed in one day; however, maximum length of open trench shall never exceed 600 feet (182.9 m). This length includes open excavation, pipe laying and appurtenant construction and backfill which has not been temporarily resurfaced.

- F. Loose cobbles or boulders shall be removed from the sides of the trenches before allowing workmen into the excavation, or the trench slopes must be protected with screening or other methods. Trench side slopes shall be kept moist during construction to prevent local sloughing and raveling. Excess water shall be removed from the trench.
- G. Surcharge loads due to construction equipment shall not be permitted within 5 feet (1.524 m) of the top of any excavated slope
- H. If the Contractor elects to shore or otherwise stabilize the trench sides, he shall file with the Buyer copies of drawings for same prepared and signed by a Civil Engineer duly registered in the State of Colorado before commencing excavation.
- I. The sides of the trenches shall be supported with plank sheeting and bracing, or with an approved trench box, in such a manner as to prevent caving of the sides of the trench. Space left by withdrawal of sheeting or shoring shall be filled completely with dry granular material blown or rammed in place. All trenches deeper than 5-feet (1.524 m) shall be shored unless cut to the angle of repose of the excavated soils. Shoring may be required on trenches less than 5 feet deep.
- J. Benching of the trench excavation is permitted to allow power shovel access to full depth of trench as long as all other items of item 3.3 of this section are adhered to.

3.4 OVEREXCAVATION:

- A. All unstable materials encountered below the established elevation of the excavation which will not provide a firm foundation for subsequent work shall be removed as directed.
- B. Where the excavation is directed to be made below the established elevations, the excavation, if under slabs, shall be restored to the proper elevation in accordance with the procedure specified for backfilling, or if under footings, the depth of the walls or footing shall be increased as may be directed by the Buyer.
- C. Excavations carried below the depths indicated WITHOUT SPECIFIC DIRECTION shall be returned to the proper elevation in accordance with the procedure specified for backfilling,

except that in wall or footing excavations, the concrete shall be extended to the bottom of the excavation.

3.5 BACKFILLING:

- A. Prior to backfilling, remove all forms and clean excavations of all trash and debris. Refer to the Drawings for backfill material and details.
- B. Trenches for piping, conduits, or other underground utilities shall be backfilled to a minimum of 6 in. over the top of the pipe, conduit, cable, etc., with sand fill unless otherwise detailed on the Drawings.
- C. Fill shall be placed in horizontal layers not in excess of 6 inches in thickness and shall have a moisture content such that the required degree of compaction may be obtained. Each layer shall be compacted by hand or machine tampers or by other suitable equipment to 90 percent of maximum density as determined by the Modified Proctor Testing Method.
- D. Install Buyer-furnished orange warning tape 12 inches above any underground utilities or piping.

3.6 PLACEMENT OF FILL ABOVE GRADE

- A. Preparation of Ground Surface:
 - 1. Where fill is placed over existing pavement or compacted gravel, scarify and compact the existing surface before placing fills.
 - 2. Uniformly moisten areas to receive fill and compact to minimum 90 percent of maximum density as determined by the Modified Proctor Testing Method.
 - 3. Immediately following wetting, uniformly compact the material by rolling to obtain 90 percent maximum density as determined by the Modified Proctor Testing Method.
- B. Spreading Fill Material:
 - 1. Completed fill shall correspond to the contours shown on the Drawings.
 - 2. Place fill materials in successive layers of loose materials not more than 6 in. deep.
 - 3. Uniformly spread each layer using a road machine or other approved device.
 - 4. Compact each layer of fill thoroughly using an approved roller to obtain 90 percent maximum density, as determined by the Modified Proctor Testing Method.

3.7 SUBGRADE PREPARATION

- A. The foundation footings and foundation wall shall be constructed on undisturbed ground. In the event that ground beneath the foundation footings and wall is overexcavated, it shall be refilled to grade with compacted structural fill. Structural fill shall be compacted to a minimum of 95 percent of maximum density at optimum moisture.
- B. The surface beneath the slab shall be overexcavated a minimum of two feet and refilled to slab grade with compacted select granular structural fill. Structural fill shall be compacted to a minimum of 95 percent of maximum density at optimum moisture.

3.8 COMPACTION:

- A. Except as otherwise specified, moisture/density relationships shall be as determined by American Society for Testing and Materials (ASTM) D1557, and the degree of field compaction shall be controlled with ASTM D1556 or ASTM D2922. All tests will be taken by the Buyer.
- B. The Buyer will pay for any test for soil compaction that passes the requirements of the Specifications, but the Contractor shall pay for any soil tests that indicate the soil compaction does not meet requirements of the Specifications.

3.9 GRADING:

- A. Uniformly smooth grade all areas covered by the project, including excavated and backfilled sections, and adjacent transition areas. The degree of finish shall be that ordinarily obtainable from either blade graded or scraper operations.
- B. The finish surface shall be not more than 0.15 feet above or below the established grade or approved cross section.
- C. All drainage swales shall be finished so as to drain readily.

3.10 DISPOSAL OF DEBRIS AND EXCESS MATERIAL: All debris and excess material must be tested per item 3.1.F of this section before disposal. Rubble and debris not restricted per item 3.1.F of this section and not suitable for fill shall be transported to a sanitary landfill 1 mile northeast of Access Gate 8.

Excess material from excavation, not restricted per item 3.1.F of this section, and unsuitable for or not required for backfilling, shall be wasted, spread, and leveled or graded as directed by the Buyer within 1 mile of the site.

3.11 WATER CONTROL

- A. Construction shall take place such that surface drainage water and ground water (if any) in the construction zone shall be minimized.
- B. Drainage water which must be removed from the construction zone during excavation and construction shall be pumped by the Contractor to a tanker truck or trailer provided by the Buyer. The Buyer will be responsible for removal of this water.
- C. Drainage water shall be handled so that no damage will be done to the excavations, pipe, or structures. The Contractor shall be responsible for any damages to persons or property on or off the construction site due to such drainage water.
- D. Grading shall be done as necessary to prevent surface water from flowing into excavations.

3.12 COVERING OF EXCAVATION AND FOUNDATION

- A. With the intention of minimizing the amount of rainfall which enters the excavation and foundation, an impervious cover shall be placed over the immediate excavation hole and foundation site at the end of each work day, or whenever work is stopped for more than a few hours.
- B. The impervious cover shall be constructed of a material approved by the Buyer. The cover shall be supported in the center such that it is a minimum one foot higher in the center of the building site and slopes to the outside.
- C. During the construction period, the cover shall be temporarily anchored on the outside a minimum of six feet outside the excavation or foundation. Temporary anchoring shall be adequate to hold the cover in place and resist the force of wind.
- D. Since the foundation slab is designed as a water containment slab, the final construction shall also be covered to prevent water from pooling in the slab. Therefore, the impervious cover shall be placed over the slab and foundation after construction is completed with the same support and slope towards the outside as described above. A more permanent anchoring system for final covering shall be according to the cover manufacturer's recommendations.

END OF SECTION

SECTION 03100
CONCRETE FORMWORK

PART I: GENERAL

- 1.1 RELATED WORK SPECIFIED ELSEWHERE:
 - A. Section 03200: Concrete Reinforcement
 - B. Section 03300: Cast-in-Place Concrete
- 1.2 APPROVALS: All concrete formwork complete and in place shall be approved by the Buyer before concrete is placed.
- 1.3 QUALITY ASSURANCE:
 - A. Requirements of Regulatory Agencies: The requirements of OSHA Part 1926, Section 1926.701 apply to the Work of this Section, and the Contractor shall prepare and maintain at least one copy of the required Drawings at the site. Design of the structures shown on the Drawings does not include any allowance or consideration for imposed construction loads. Forms, shoring and falsework shall be adequate for imposed live and dead loads, including equipment, height of concrete drop, concrete and foundation pressures, stresses, lateral stability, and other safety factors during construction.
- 1.4 SHOP DRAWINGS: Submit Shop Drawings at least 15 working days in advance of form fabrication for sequence of forming and concrete placing.

PART II: PRODUCTS

- 2.1 FORMS:
 - A. Forms for all surfaces shall be made of surfaced lumber, plywood, or material which will provide a surface at least equal to surfaced lumber or plywood.
 - B. Forms for all exposed surfaces shall be constructed of plywood or an approved equal. Plywood for forms shall be of the grade Exterior B-B (concrete form) conforming to the latest Product Standard for Soft Plywood, Construction and Industrial, of the National Bureau of Standards.
 - C. Plywood panels shall be not less than 5/8 in. thick.
 - D. Plywood less than 5/8 in. thick otherwise conforming to the requirements specified herein may be used with a continuous backing of 3/4-in. sheeting.
 - E. Metal forms shall be approved by the Buyer.

2.2 MISCELLANEOUS MATERIALS:

- A. Form Coating: A colorless mineral oil similar to Horn's form film.
- B. Form ties shall be adjustable in length and be so constructed that no metal will be within 1 in. of finished surfaces after form removal. Wire ties shall not be used where the concrete will be exposed to weathering or to view.

2.3 FORM JOINT SEALERS: For joints between form panels, use resilient foam rubber strips, nonhardening plastic type calking compound free of oil, or waterproof pressure-sensitive plastic tape of minimum 8 mil thickness and 2 in. (50mm) width. For form tie holes, use rubber plugs, plastic calking compound, or equal.

2.4 MOLDS: For grooves, drips, rebates, profiles, chamfers, and similar items, smooth milled pine or douglas fir coated with specified form coating, or standard product extruded polymer plastic units of the indicated or required shapes.

PART III: EXECUTION

3.1 DESIGN REQUIREMENTS: Formwork shall be designed and erected by the Contractor in accordance with the American Concrete Institute (ACI) Recommended Practice for Concrete Formwork (ACI Standard 347) and in accordance with the following:

- A. Forms shall conform to the shape, lines, and dimensions of members as called for on the Drawings and shall be substantial, free from surface defects, and sufficiently tight to prevent leakage of concrete.
- B. Forms shall be properly braced or tied together to maintain position and shape under load.
- C. Joints shall be leakproof and arranged vertically.
- D. Lumber previously used in forms shall have nails withdrawn, and surfaces to be exposed to concrete shall be cleaned before reuse.
- E. Form shall be so placed as to be readily removable without hammering or prying against the concrete.

3.2 CORNER FORMS: All vertical and horizontal corners to be exposed when forms are removed shall have a 3/4- X 3/4-in. minimum chamfer unless indicated otherwise on the Drawings.

- 3.3 EQUIPMENT PADS: Equipment pad sizing and location as well as anchor bolt size, type and location shall be confirmed by equipment manufacturer.
- 3.4 COATING:
- A. Apply two coatings of form oil to forms before placing concrete.
 - B. After application, remove surplus oil from forms, and before placing concrete, remove all oil from reinforcing steel.
- 3.5 EMBEDDED PIPING AND ROUGH HARDWARE: All trades which require openings for the passage of pipes, conduits, and other inserts shall be consulted and the necessary pipe sleeves, anchors, or other required inserts shall be properly and accurately installed, and equipment pads properly sized. Openings shall be reinforced as indicated and required. Conduits or pipes shall be located so as not to reduce the strength of the construction, and in no case shall pipes other than conduits be placed in a slab 4-1/2" (11 cm) or less in thickness. Conduit embedded in a concrete slab shall not have an outside diameter greater than 1/3 of the thickness of the slab nor be placed below bottom reinforcing steel or over top reinforcing steel. Conduits may be embedded in walls provided they are not larger in outside diameter than 1/3 the thickness of the wall, are not spaced closer than three diameters on center, and do not impair the strength of the structure. Embedded pipes and conduits shall be supported independently from reinforcing steel in manner to prevent metallic contact and thereby prevent electrolytic deterioration. Pipes and conduits where embedded shall be placed as nearly as possible to the center line of the concrete section. All conduit, piping and other wall penetrations, reinforcements and anchor bolt sizing and locations shall be subject to Buyer's review and approval.
- 3.6 REMOVAL OF FORMS AND FALSE WORK:
- A. Leave false work and forms in place under structural slabs, beams, and girders for 14 days after the day of the last pour except:
 - 1. When high early strength cement is used, forms for all structures may be removed after 2 days.
 - 2. In cold weather, this length of time shall be determined by the 2 utilizing test cylinders cured under jobsite conditions.
 - B. Removal all other forms in not less than 12 hr.

3.7

FILLING HOLES: Holes remaining from bolts or form ties or rods shall be filled solid with non-shrink grout. All excess mortar at face of filled holes shall be struck-off flush.

END OF SECTION

SECTION 03200
CONCRETE REINFORCEMENT

PART I: GENERAL

- 1.1 RELATED WORK SPECIFIED ELSEWHERE:
 - A. Section 03100: Concrete Formwork
 - B. Section 03300: Cast-in-Place Concrete
- 1.2 DELIVERY AND HANDLING:
 - A. Deliver steel reinforcement in an undamaged condition, and store away from drainage ways and vehicular traffic.
 - B. Handle reinforcement in a manner that will avoid bending or permanent deforming of the bars.
- 1.3 SUBMITTALS: Submit the following in advance of fabrication in conformance with applicable requirements of General Conditions.
 - A. Shop Drawings: Submit Shop Drawings for reinforcing steel prepared in accordance with ACI 315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures". Show layouts, bending diagrams, assembly diagrams, dimensioned types and locations of all bar laps and splices, and shapes, dimensions, and details of bar reinforcing and accessories. Include layout plans for bar supports and chairs, with typical details. Dimensions and quantities shown on the Shop Drawings are the responsibility of the Contractor and Buyer's approval of Shop Drawings shall not constitute approval of dimensions and quantities thereon.
 - B. Samples: Submit two 12" (30.5cm) long samples of each bar support and two samples of each individual type chair, with catalog data.

PART II: PRODUCTS

- 2.1 MATERIALS:
 - A. Reinforcement Bars: Conform to American Society for Testing and Materials (ASTM) A-615, Grade 60.
 - B. Mesh Reinforcement: Conform to ASTM A-185.

PART III: EXECUTION

3.1 DESIGN: Reinforcing details shown on the Drawings shall govern the furnishing, fabrication, and placing of reinforcement. Construction shall conform to the following requirements:

A. Quantities and placement of reinforcement shall be in accordance with American Concrete Institute Standard 318 and the Manual of Standard Practice of the Concrete Reinforcing Steel Institute.

B. Splices:

1. Splices of bars shall be made only where shown on the plans or as approved by the Buyer. Where bars are spliced they shall be lapped at least 30 bar diameters unless otherwise shown on the Drawings.

2. Splicing shall be accomplished by placing the bars in contact with each other and wiring them together with annealed steel wire, 16 gage minimum.

3. Welding of reinforcing steel will not be permitted unless specifically authorized by the Buyer.

3.2 PLACING OF REINFORCEMENT:

A. Before placing, thoroughly clean all reinforcement of rust, dirt, mill scale or coatings, and other material which would reduce the bond.

B. Reinforcement appreciably reduced in section shall not be used.

C. Following any substantial delay in the work, previously placed reinforcement left for future bonding shall be inspected and cleaned.

D. Do not bend or straighten reinforcement in a manner that will injure the material.

E. Heating of reinforcement for bending or straightening will not be permitted.

F. Torch cutting of reinforcing steel will not be permitted.

- G. Reinforcement shall be accurately placed and securely tied at all intersections and splices with 16-gage black annealed wire and shall be securely held in position during the placing of concrete by spacers, chairs, and approved supports.
- H. Welded Wire Mesh: Install necessary supports and chairs to hold in place during concrete pours. Straighten mesh to lay in flat plane and bend mesh as shown or required to fit work. Laps shall be no less than one complete mesh unless otherwise detailed. Tie every other wire at laps.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART I: GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE:

- A. Section 03100: Concrete Formwork
- B. Section 03200: Concrete Reinforcement

1.2 APPROVALS:

- A. Obtain written approval from the Buyer before placing concrete.
- B. Obtain approval from the Buyer for each individual pour or structure.

1.3 DESIGN CRITERIA:

- A. The design of the concrete mix, that is, the exact proportion of cement, aggregates, additives, and water, shall be the responsibility of the Contractor.
- B. The proposed mix shall be submitted for approval 10 working days prior to placing concrete.

1.4 ENVIRONMENTAL REQUIREMENTS:

- A. Temperature: Do not place concrete unless the atmospheric temperature in the shade is above 40 degrees F and rising (except as noted below).
- B. Weather: Do not place concrete in rainy weather.
- C. Cold Weather Concreting:
 - 1. Obtain permission from Buyer before doing any cold weather concreting.
 - 2. Perform concrete work in accordance with American Concrete Institute (ACI) Standard 306 when the mean daily temperature is 40 degrees F or there is a danger of the temperature falling below 32 degrees F.

PART II: PRODUCTS

2.1 MATERIALS:

A. Cement:

1. Portland Cement: Conform to American Society for Testing and Materials (ASTM) C150, Type I or Type II.
2. Air-Entraining Portland Cement: Conform to ASTM C150, Type IA or IIA, low alkali.
3. High Early Strength Portland Cement: Conform to ASTM C150, Type III.

B. Aggregate:

1. Aggregate for Regular-Weight Concrete: Conform to ASTM C33.
2. Aggregate for Lightweight Concrete: Conform to ASTM C33.
3. Coarse aggregate shall be 3/4- to 1-1/2-in. maximum size.

C. Water: Clean and potable.

D. Admixtures:

1. Air Entraining: Conform to ASTM C260.
2. Obtain approval for use of admixtures (except air entraining). No calcium chloride shall be used.

E. Expansion Joint Material:

1. For vertical application, use self-expanding cork or sponge rubber conforming to ASTM D1752.
2. For horizontal application, use nonextruding asphalt-impregnated fiber material conforming to ASTM D1751.

F. Curing Materials:

1. Water-Proof Paper: Conform to ASTM C171, Type I or Type II.
2. Polyethylene Sheeting: Minimum 4 mils thick, white color.
3. Curing Compound: Conform to ASTM C309, Type 2, having a white-pigmented base.

2.2 PROPORTIONING OF CONCRETE:

- A. Concrete shall be proportioned in accordance with ACI Standard 211.1 to attain the required design strength.
- B. Air entrainment shall be used in concrete for all structures that will be exposed to freezing and thawing including subsurface within frostline.
- C. The concrete shall have a slump appropriate for the selected work. Slump shall not be less than 1 in. nor greater than 4 in. except as authorized by the Buyer.
- D. Concrete shall be designed to develop the minimum compressive strength as shown on the Drawings. When the compressive strength is not indicated on the Drawings, it shall be a minimum of 4,000 PSI at 28 days.

2.3 MIXING OF CONCRETE:

- A. Concrete shall be mixed in accordance with ACI Standards 318 and 304.
- B. Transit-mixed concrete shall be mixed and delivered in accordance with ACI Standard 304.
- C. When necessary for proper control of concrete, mixing of transit-mixed concrete shall be done at site of concrete placement.

PART III: EXECUTION

3.1 PREPARATION FOR PLACING CONCRETE:

- A. Remove water and mud from excavation.
- B. Remove hardened concrete, wood chips, ice, and other debris from the interior of forms.
- C. Oil or wet forms just prior to placing concrete.
- D. Notify other crafts so they may deliver anchors for other work. Obtain their assistance in setting anchors if required.
- E. Moisten absorptive foundations against which concrete will be placed.

3.2 PLACING CONCRETE:

- A. Concrete shall be placed in accordance with ACI Standards 318 and 304.

- B. Concrete shall be placed in forms within 60 min. from the time of introduction of cement and water.
- C. Do not retemper concrete.
- D. Deposit concrete as close as practicable to its final position. Do not drop concrete more than 3 ft.
- E. Place concrete in continuous horizontal layers; the depth of each layer shall not exceed 12 in.

3.3 MECHANICAL AGITATION:

- A. Immediately after depositing, compact the concrete by means of mechanical vibrators in accordance with ACI standards. Slabs may instead be compacted by means of grid tampers when approved by the Buyer.
- B. Vibrator shall be flexible electric type or approved compressed-air type.
- C. Do not place vibrator against reinforcing or forms or use vibrator to transport concrete within forms.

3.4 FINISHING HARDENED CONCRETE:

- A. Smooth Finish: Give smooth finish to all exterior concrete surfaces, except slabs, that will be exposed to view.
 - 1. Thoroughly wet and then brush coat surfaces with cement grout (one part Portland cement to two parts fine aggregate mixed with water to consistency of thick paint).
 - 2. Spread grout with sponge or wood float to fill all pits and surface irregularities.
 - 3. Scrape off excess grout and rub surface with burlap to remove visible grout film.
 - 4. In hot weather, keep grout damp by means of fog spray during the setting period.
- B. Rubbed Finish: Give rubbed finish to interior concrete surfaces, except slabs, that will be exposed to view.
 - 1. Give smooth finish as specified above, then rub with carborundum stones and water.
 - 2. Do not use mortar or grout during rubbing.
 - 3. Remove excess mortar that is worked up during rubbing.

3.5 FINISHING FRESH CONCRETE:

- A. Monolithic Slab Finish: Give monolithic finish to interior floor slabs.
 - 1. Compact fresh concrete and screed to required elevation.
 - 2. Float to a true, even plane with no coarse aggregate visible.
 - 3. After surface moisture has disappeared, steel trowel floor slab to a smooth, even finish, free from trowel marks.
- B. Broomed Finish: Give broomed finish to all trading surfaces of docks, walks, and steps exterior to the building.
 - 1. Give monolithic finish as specified above, except immediately after steel troweling brush surface with a stiff bristle brush.
 - 2. Brush in parallel strokes at right angles to the normal flow of traffic.
- C. Slab Flatness Tolerances: Finished cast-in-place slabs shall not vary more than 1/8 in. from a 10-ft. straightedge.
- D. No water shall be added to finished surface.

3.6 CURING: Protect concrete against loss of moisture for at least 7 days by using one of the following methods for the surfaces indicated:

- A. Vertical Surfaces and Under Surfaces of Beams and Elevated Slabs:
 - 1. Moist cure with forms in place for the full curing period, or
 - 2. Cover with wet burlap, or
 - 3. Fog spray.
- B. Slabs Ongrade and Floor Slabs:
 - 1. Cover with water-proof curing paper or polyethylene sheet, lapped 4 in. at joints and sealed with tape or
 - 2. Cover with burlap or cotton mats and keep such covering continuously wet or

3. Apply curing compound in a two-coat continuous operation using a minimum of 1 gal. per 200 ft² for each coat. Apply second coat at right angles to direction of first coat.

C. Exterior Walks, Docks, and Stairs:

1. Apply curing compound in a two-coat continuous operation using a minimum of 1 gal. per 200 ft² for each coat. Apply second coat at right angles to direction of first coat or
2. Use method indicated in paragraph A above.
3. Do not use curing compound on concrete surface to which future concrete will be bonded.

3.7 PATCHING:

- A. Immediately after removal of forms, remove all fins and loose material.
- B. Chip out to solid concrete all honeycomb, aggregate pockets, and voids over 3/4 in. in diameter.
- C. Fill chipped holes with epoxy mortar or neat cement grout. Finish holes flush to adjacent surfaces.
- D. Damp cure patchwork for 72 hr.

3.8 FIELD QUALITY CONTROL:

A. Sample-Taking:

1. Preparation of concrete samples and testing of such samples shall be the responsibility of the Buyer.
2. The Contractor shall provide assistance in obtaining concrete samples.
3. The buyer may take three test cylinders from each placement of 50 yd³ or fraction thereof.

B. Compression Tests:

1. Test cylinders shall be made in accordance with ASTM C31 and tested in accordance with ASTM C39.
2. One cylinder will be tested at 7 days, one at 28 days, and one retained as a spare.

- C. Slump Tests: Slump of concrete shall be determined at point of discharge from the mixer in accordance with ASTM C143.

END OF SECTION

SECTION 03600--GROUT

PART I: GENERAL

- 1.1 DELIVERY AND STORAGE: Store all grouting materials in undamaged condition with seals and labels intact as packaged by the manufacturer.

PART II: PRODUCTS

2.1 GROUT

- A. Composition shall be one part Portland cement and three parts sand.
- B. Add water to create a stiff mixture.
- C. Minimum compressive strength shall be 1,500 PSI at 28 days.
- D. Discard grout not placed after 1 1/2 hr.

PART III: EXECUTION

3.1 GROUTING

- A. Pack grout tightly around well casings, pipe or conduit in penetrations through masonry or concrete walls and other locations as called for or shown on the drawings.
- B. Smooth exposed surfaces of grout to blend with adjacent surfaces.

END OF SECTION

SECTION 03601

NONSHRINK GROUT

PART I: GENERAL

- 1.1 DELIVERY AND STORAGE: Store all nonshrink grouting materials in undamaged condition with seals and labels intact as packaged by the manufacturer.

PART II: PRODUCTS

2.1 MATERIALS:

- A. Nonshrink grout for setting column bases, anchor bolts, equipment, and other items shown on the Drawings shall be one of the following types:
 - 1. EMBECO (premix): As manufactured by Master Builders Company.
 - 2. Ceilcote 648: As manufactured by The Ceilcote Company, Inc.
- B. Adhesive for Ceilcote Grout: Ceilcote 348 Adhesive Fast Set as manufactured by The Ceilcote Company, Inc.
- C. Portland Cement: Conform to American Society for Testing Materials (ASTM) C150, Type I.
- D. Sand: Conform to ASTM C33, Fine Aggregate.
- E. Pea Gravel: Conform to ASTM C33, Coarse Aggregate, graded so that at least 90% passes 3/8-in. sieve and 90% is retained by a No. 4 sieve.

2.2 MIXES:

- A. EMBECO Grout:
 - 1. For less than 2-in. clearances or where size or shape of space makes grouting difficult, use standard EMBECO grout and water.
 - 2. For greater than 2-in. clearances where coarse aggregate will not obstruct free passage of the grout, use EMBECO grout with 3/8-in. aggregate (premixed).
 - 3. Use the minimum amount of water necessary to produce a flowable grout without causing either segregation or bleeding. After the grout has been mixed, do not add more water for any reason.

- B. Ceilcote Grout: Mix according to manufacturer's instructions.
- C. Portland Cement Mortar for Raked-Out Edges of EMBECO Grout: one part Portland cement, two parts sand, and 0.50 parts water by weight.

PART III: EXECUTION

3.1 FORMWORK:

- A. Build leakproof forms that are strong and able to withstand grout pressures.
- B. Provide enough clearance between the formwork and the area to be grouted to permit proper placement of grout.

3.2 SURFACE PREPARATION:

- A. Clean concrete surfaces to be grouted of all defective concrete, dirt, oil, grease, and other foreign matter.
- B. Lightly roughen the concrete.
- C. Remove grease and foreign materials from all steel surfaces in contact with grout.
- D. Align, level, and maintain final positioning of all components to be grouted.
- E. Saturate all concrete surfaces with clean water, remove excess water, and leave none standing.

3.3 PLACING:

- A. Place nonshrink grouting quickly and continuously by the most practical means permissible: pouring, pumping, or under gravity pressure. Do not use either pneumatic-pressure or dry-packing methods without written permission from the Buyer.
- B. Where practical, apply grout from one side only to avoid entrapping air.
- C. Do not vibrate the placed grout mixture or allow it to be placed if the area is being vibrated by nearby equipment.
- D. Do not remove leveling shims for at least 48 hr. after grout has been placed.
- E. After the EMBECO grout has reached initial set, rake out all exposed edges approximately 1/2 in. into the grouted area and point with cement-sand mortar or grout.

3.4 CURING: Cure grout for 3 days after placing by keeping wet and covering with curing paper or by another approved method.

END OF SECTION

PART II
DRAWINGS

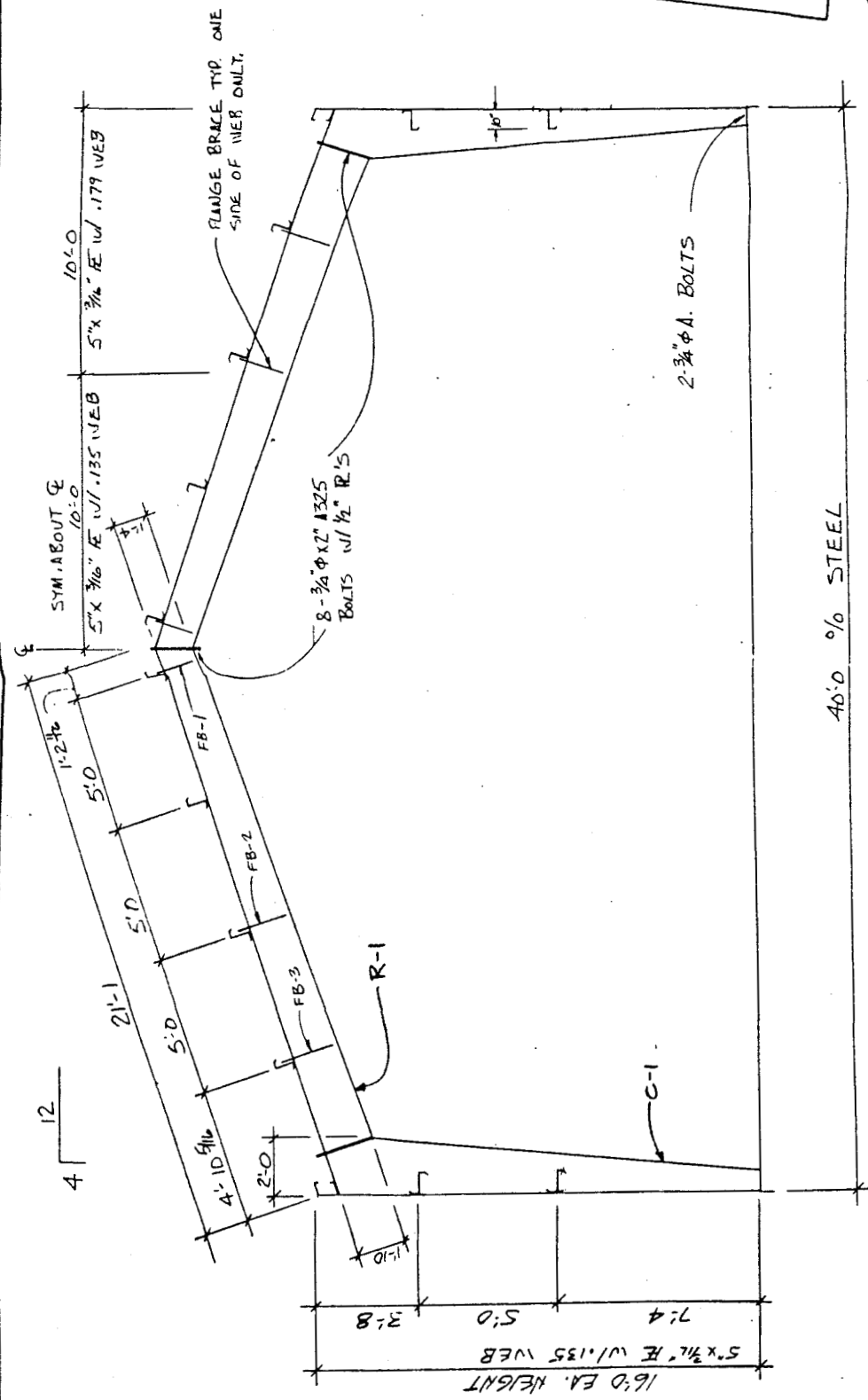
APPENDIX A

PRESTON STEEL BUILDING CO.
GREELEY, COLO.

BUILDING DETAILS

DESTROY PREVIOUS PRINTS
REVISER

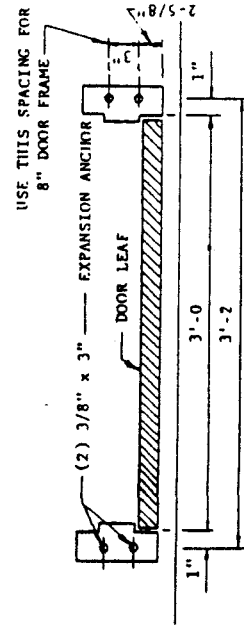
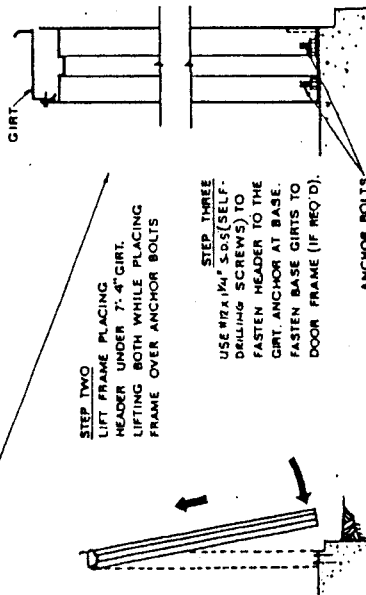
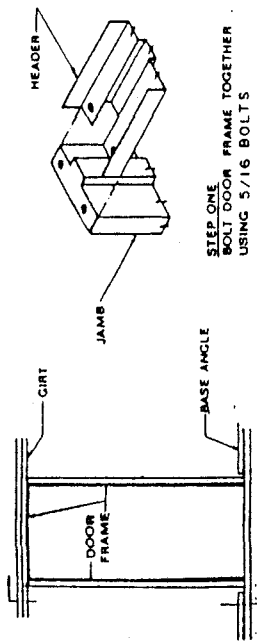
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MAIN FRAME CROSS SECTION

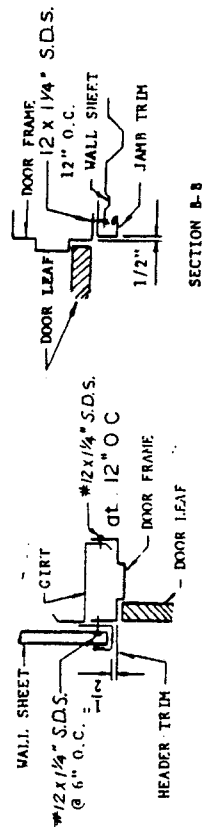
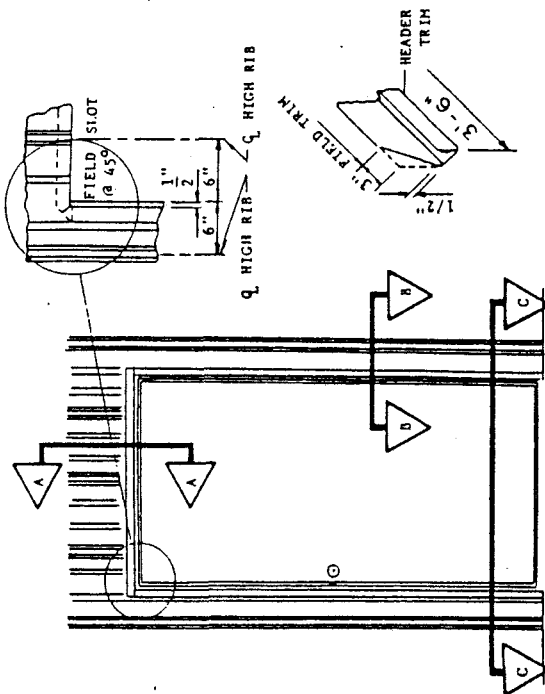
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DWG. BY: KLT SCALE: NTS				
JOB NO. 77318				
DWG. MF-1				

Preston
STEEL BUILDING CO
GREELEY CO.
(303) 339-3310



SECTION C-C

MATCH SPACING OF DOOR FRAME ANCHOR PLATE



SECTION A-A

SECTION B-B

NOTES:

REVISED

DESTROY PREVIOUS EDITION

REVISIONS

NO. DATE REV. BY

Preston
STEEL BUILDING CO.
GREELEY CO.
(303) 339-5310

CUSTOMER:

SATELLITE/ROCK FLATS

LOCATION: G. LOREN CO

DATE: 27 June 88

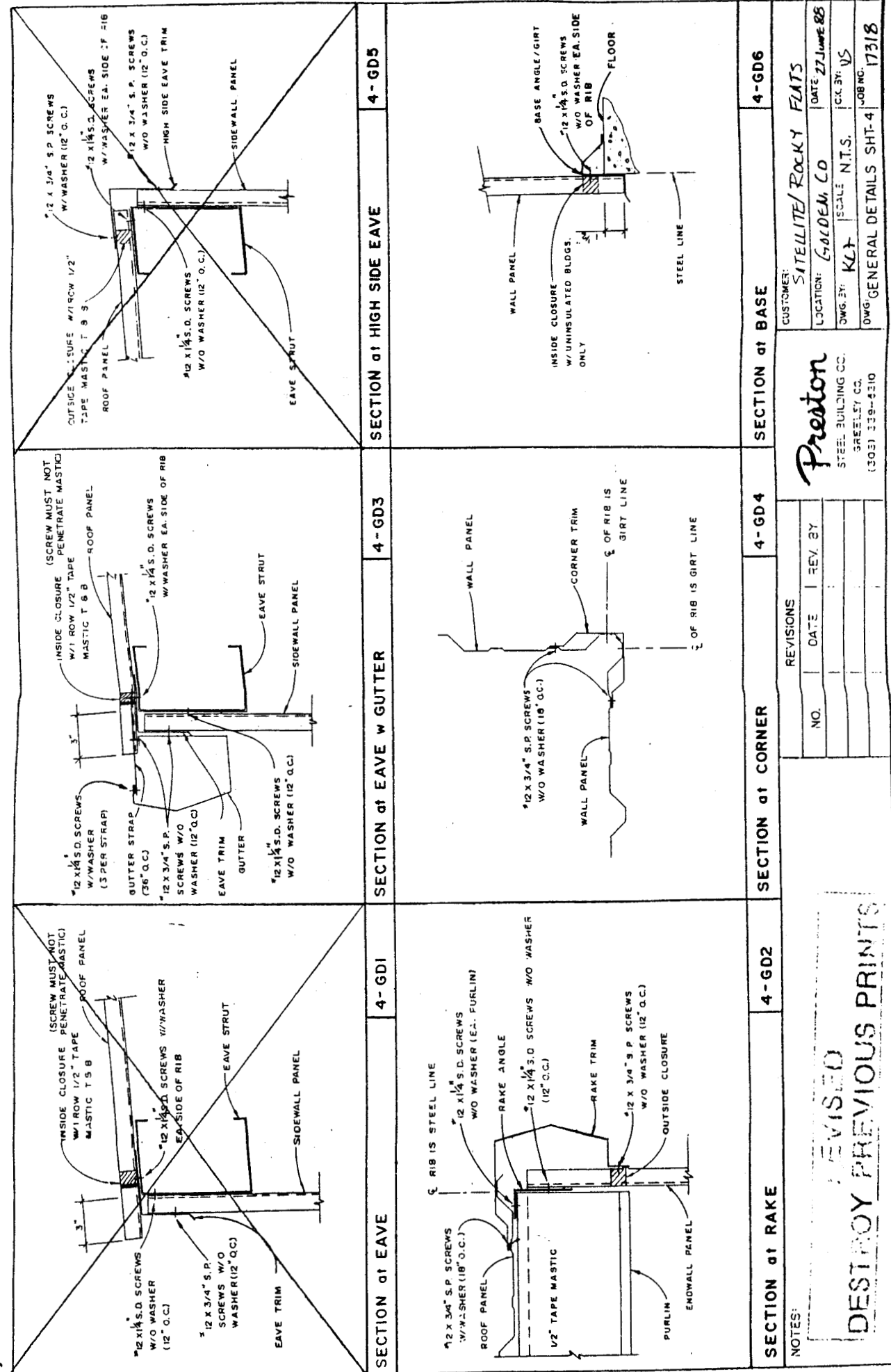
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JOB NO. 17318

WALK IN DOOR DETAILS-2010

DOOR JAMB 'LEFT SIDE' TO EAVE STRUT		DOOR JAMB 'RIGHT SIDE' TO EAVE STRUT		DOOR JAMB TO GIRT																
5-GD1		5-GD2		5-GD3																
GIRT TO DOOR JAMB		DOOR HEADER TO DOOR JAMB		DOOR JAMB TO BASE																
5-GD4		5-GD5		5-GD6																
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CUSTOMER: **SATELLITE/ROCKY FLATS**

LOCATION: **600 DEMO CD**

DATE: **27 June 88**

DWG BY: **KLT**

SCALE: **N.T.S.**

CHECK BY: **VS**

DWG NO: **17318**

GENERAL DETAILS SHT-4

Preston

STEEL BUILDING CO.

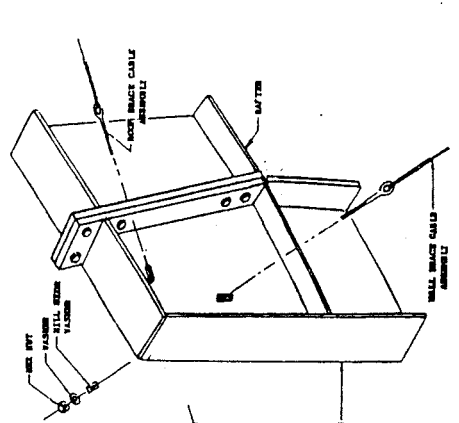
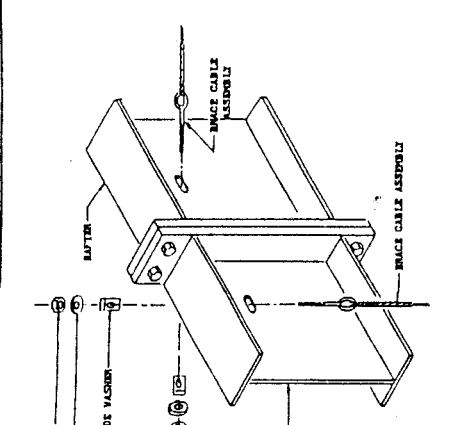
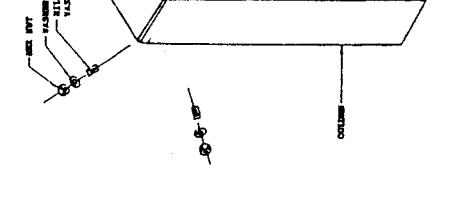
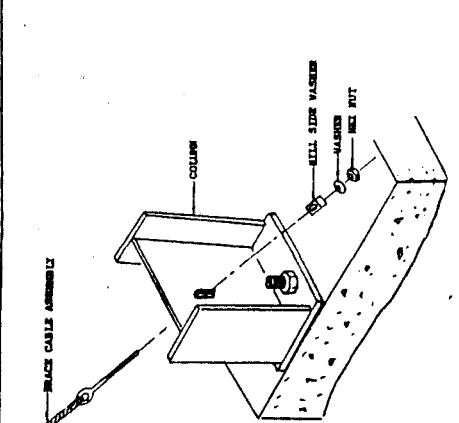
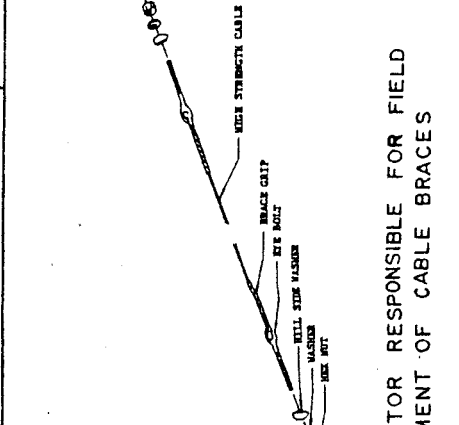


GREENEY CO.

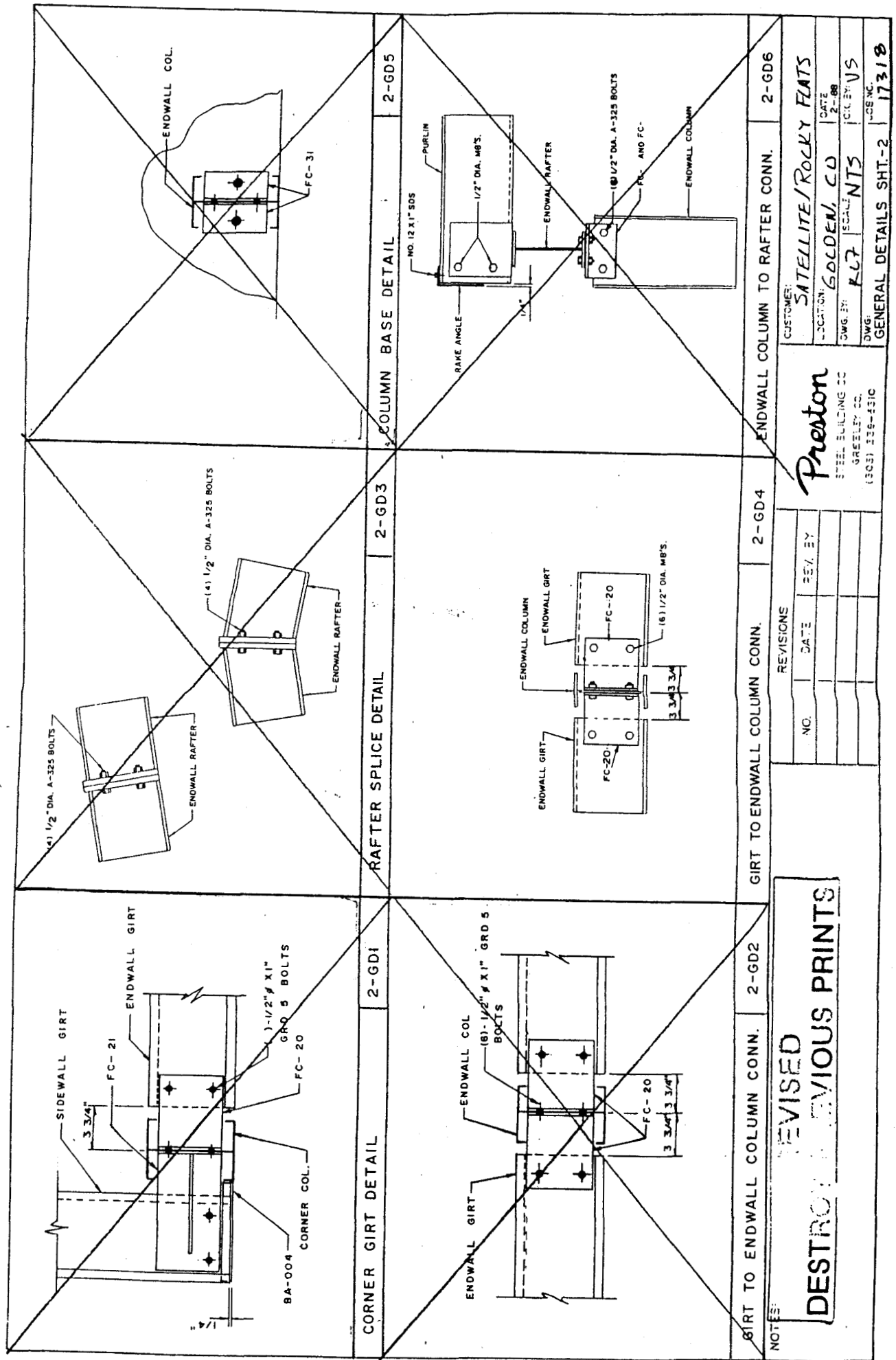
(303) 339-4310

REVISIONS		DATE	REV BY
NO.	DATE	REV BY	

NOTES:

DESTROY PREVIOUS PRINTS

		
BRACING DETAIL at RIGID FRAME	BRACING DETAIL at RAFTER SPICE	BRACING at INSET GIRT
3-GD1	3-GD3	3-GD5
	 <p>ERECTOR RESPONSIBLE FOR FIELD ADJUSTMENT OF CABLE BRACES</p>	<p>Notes:</p> <p>Proper location and proper installation of wind bracing is essential to the structural integrity of the structure.</p> <p>2. Adjustment Instructions (Wind Cable Brace Assembly)</p> <ul style="list-style-type: none">A complete Wind Cable Brace Assembly consists of two Eyebolts, Nuts and Helical Washers, Two Cable Brace Grips, and one Length of Cable.If there is not enough adjustment in the Eyebolt, unwrap one Brace Grip from Cable End.Insert one leg of Cable Brace Grip through Eyebolt as shown.Insert Cable through several turns of Cable Brace Grip close to Eyebolt.While holding Cable in position, twist legs of Cable Brace Grip around Cable until Cable is secure.It is also possible to secure Cable by wrapping Brace Grip around Cable one leg at a time.If the grip length is still not enough, repeat process at other end of Cable.  
BRACING at COLUMN BASE	CABLE BRACE ASSEMBLY	ADJUSTMENT INSTRUCTIONS
3-GD2	3-GD4	3-GD6
<p>NOTES:</p> <p>REVISED</p> <p>DESTROY PREVIOUS PRINTS</p>		
<p>CUSTOMER: SATELLITE/ROCKY FLATS</p> <p>LOCATION: GOLDEN, CO DATE: 27JUN88</p> <p>DWG. BY: KLT SCALE: N.T.S. CK. BY: 27JUN88</p> <p>DWG. GENERAL DETAILS SHT-3 JOB NO. 17318</p> <p>Preston STEEL BUILDING CO GREELEY CO. (303) 338-5310</p>		



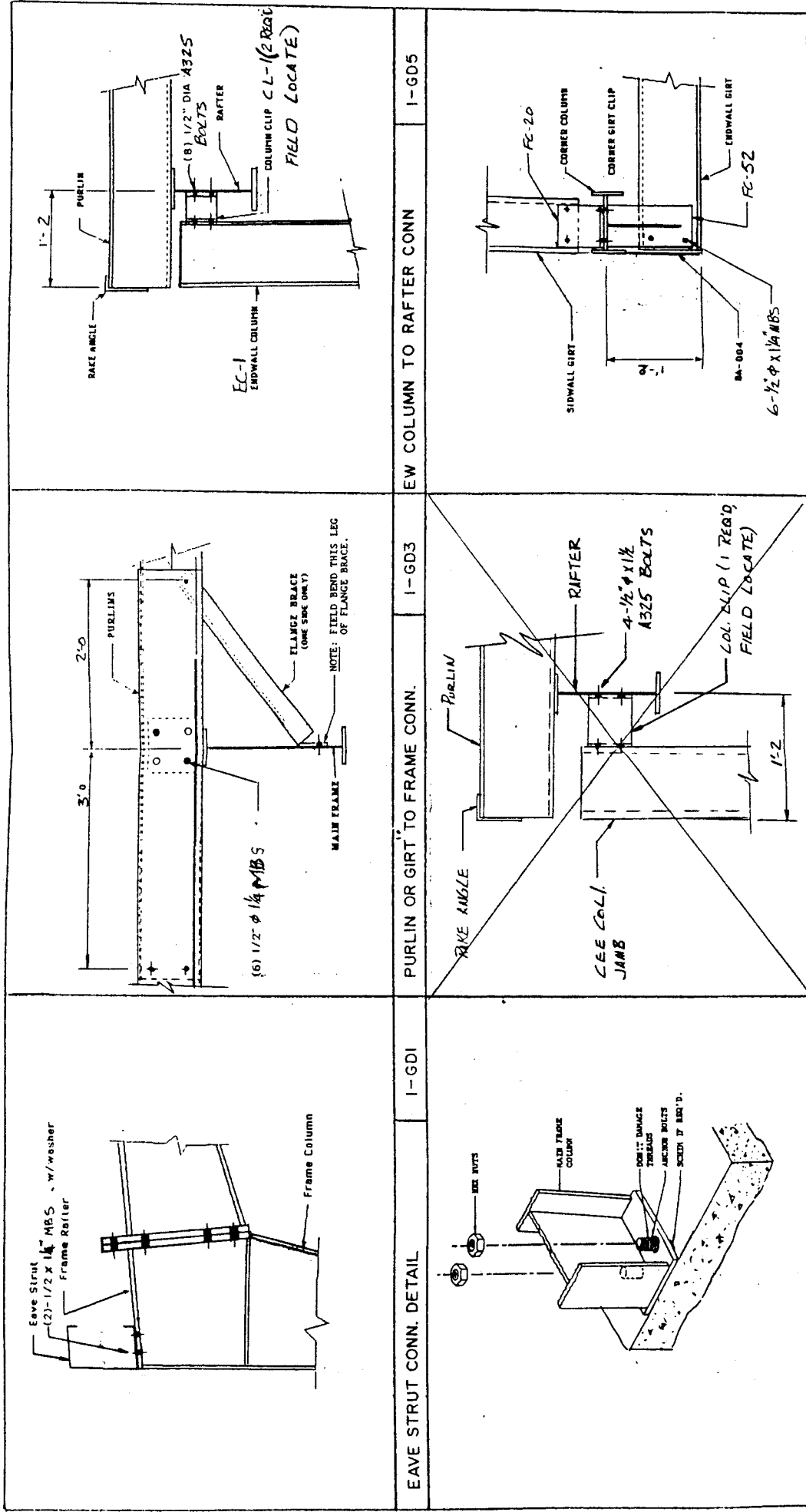
REVISED
DESTROY PREVIOUS PRINTS

REVISIONS		
NO.	DATE	REV. BY

Preston
STEEL BUILDING CO.
GREENEY CO.
(303) 336-3310

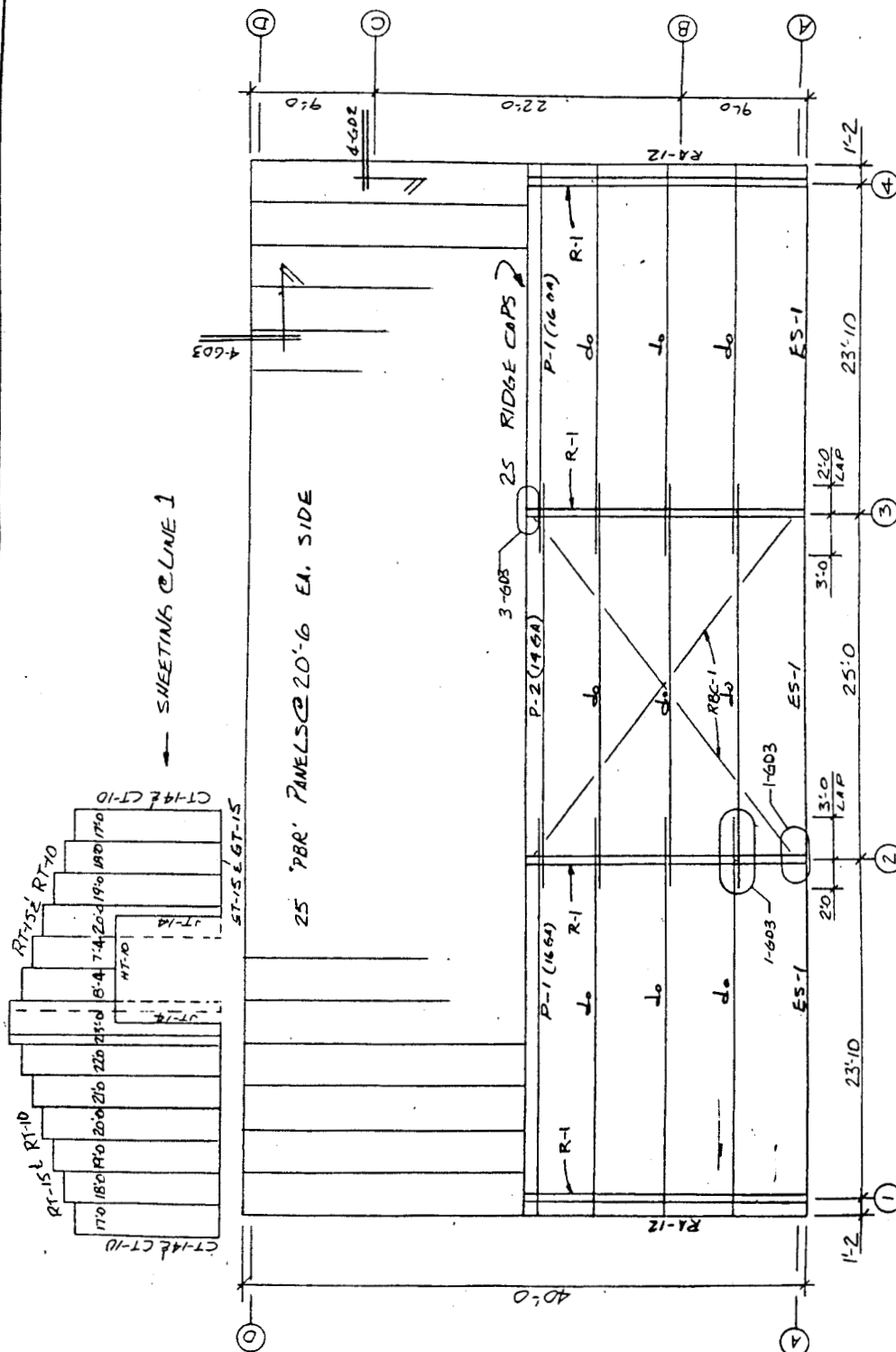
CUSTOMER: **SATELLITE/ROCKY FLATS**
LOCATION: **GOLDEN, CO** DATE: **2-88**
DWG. BY: **RLT** SCALE: **NTS** CHK. BY: **US**
DWG. NO.: **GENERAL DETAILS SHT.-2** JCS:NC
17318

NOTES:



COLUMN BASE CONN.		I-GD2	CEE COL/JAMB TO RAFTER CONN.		I-GD4	CORNER GIRT DETAIL		I-GD6
NOTES:								
REVISED			REVISED			CUSTOMER: SATELLITE/ROCKY FLATS		
DESTROY PREVIOUS PRINTS			REVISIONS			Preston STEEL BUILDING CO. BREELEY CO. PHONE: 339-4310		
			NO.	DATE	REV BY			
						LOCATION: GOLDEN, CO		
						DATE: 27 JUNE 83		
						DWG BY: VS		
						SCALE: NTS		
						JOB NO.		
						DWG. GENERAL DETAILS SH-1		
						17318		

REVISÉD
DESTROY PREVIOUS PRINTS

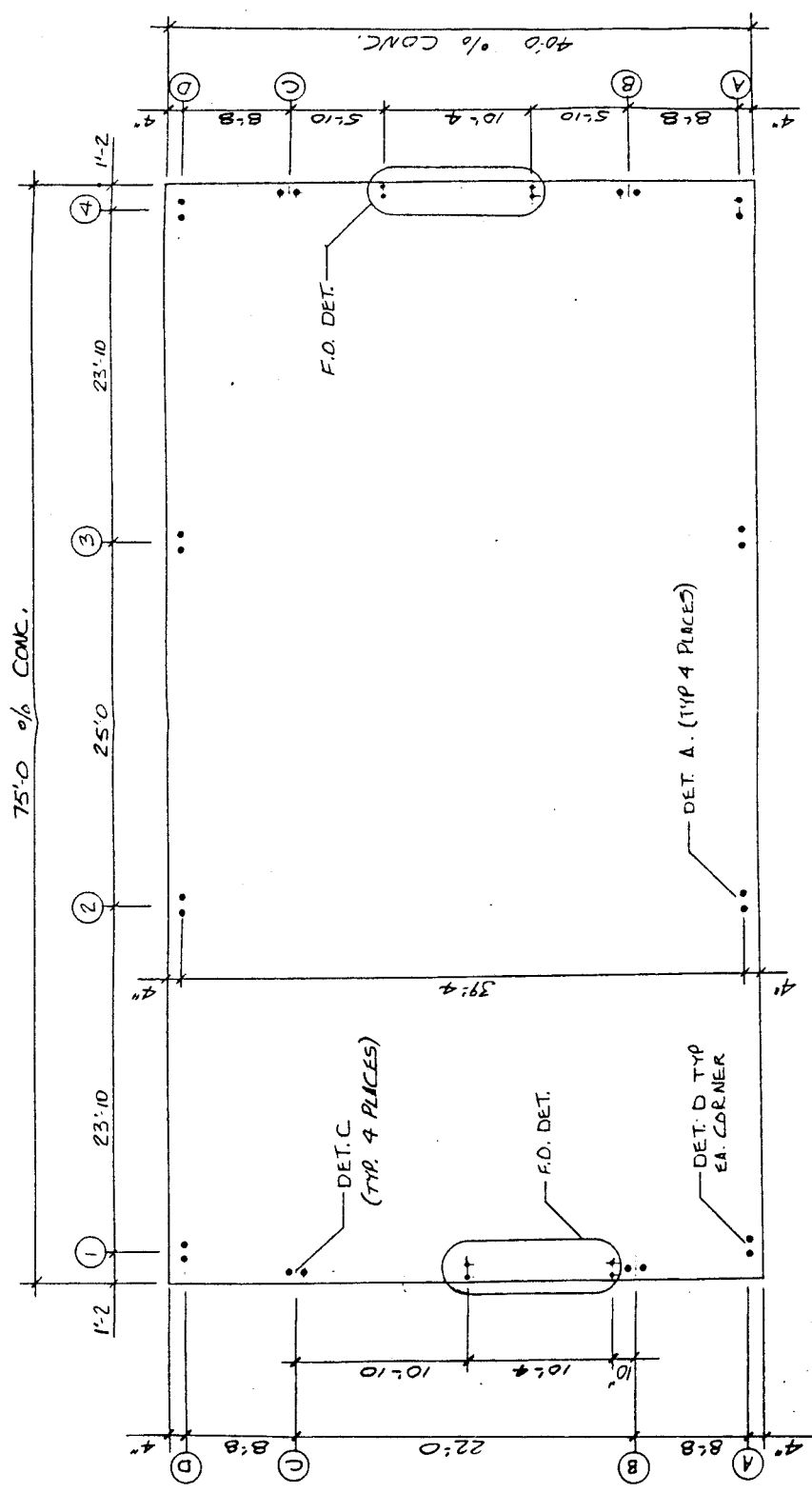


NOTES: 5/16" ϕ CABLE BRACING
 82 2 1/2 X 16 TYP END BAY PURLINS
 82 2 1/2 X 14 TYP INT. BAY PURLINS
 ① REV. COL. LOCATION!

REVISIONS		
NO.	DATE	REV. BY
1	30 June 88	KCT

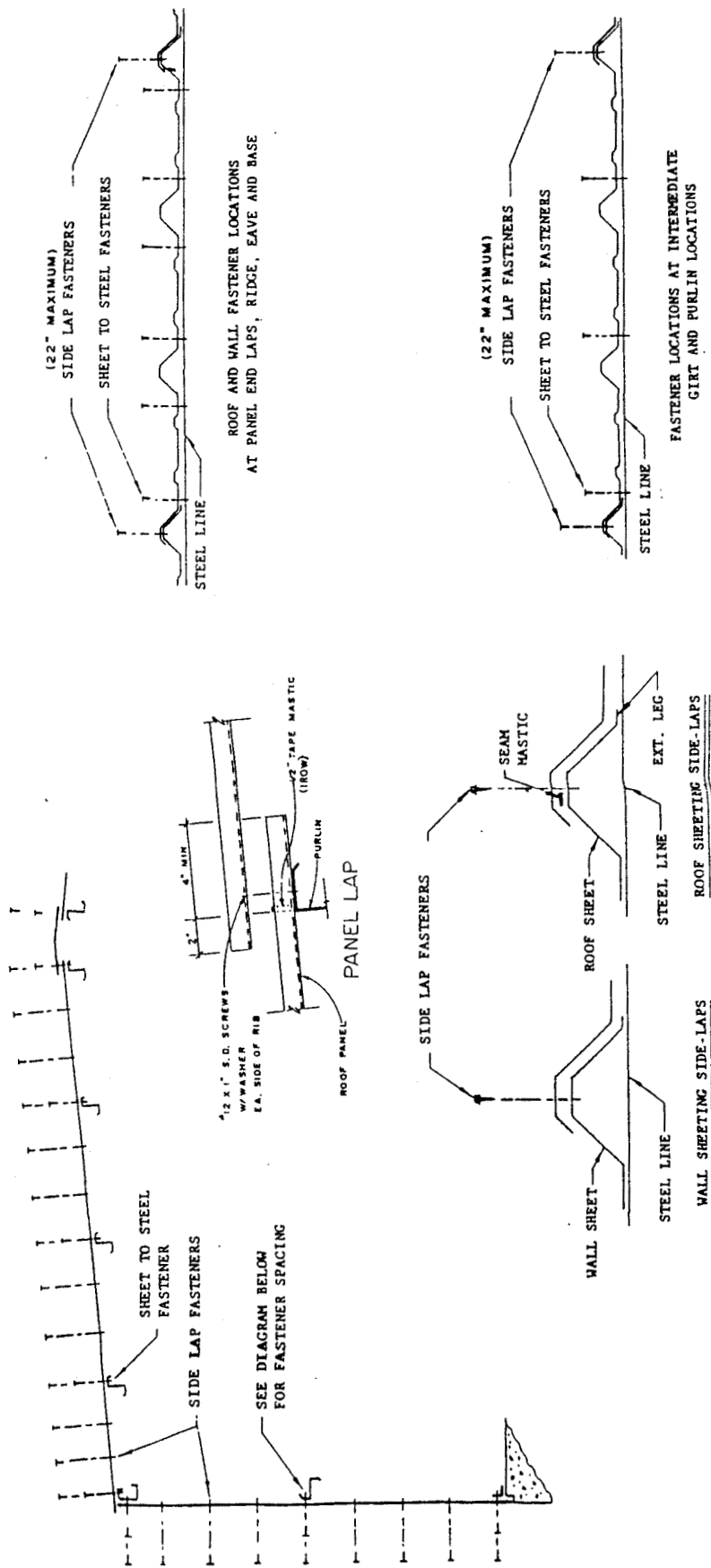
Preston
STEEL BUILDING CO.
GREELEY CO.
(303) 339-5310

CUSTOMER:	SATELLITE/ Rock FLATS			
LOCATION:	GOLDEN, CO		DATE:	2-24-81
DWG. BY:	KLT	SCALE:	N/TS	
DWG:	F-1		C/K BY:	V
			JOB NO.	177



REVISED
TROY PREVIOUS PRINTS

NOTES: 40x75 x 16, #12		CUSTOMER: SATELLITE / ROCKY FLATS					
1 REVISED DOOR LOCATION		LOCATION: ENDEAL CO. DWG. BY: KLT SCALE: NTS DATE: 23 Jun 88 CK. BY: BT JOB NO. 17318					
		PRESTON STEEL BUILDING CO. GREELEY CO. (303) 339-5310					
		REVISIONS <table border="1"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>REV. BY</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>30 Jun 88</td> <td>KLT</td> </tr> </tbody> </table>		NO.	DATE	REV. BY	1
NO.	DATE	REV. BY					
1	30 Jun 88	KLT					



NOTES:

REVISIONS
NO. DATE REV. BY

REV. BY

DATE

NO.

Preston
STEEL BUILDING CO.
GREELEY CO.
(303) 339-5310

CUSTOMER:

SATELLITE/ROCKY FLATS
LOCATION: GOLDEN, CO
DATE: 27/June/88
DWG. BY: KLT
SCALE: NTS
DWG. SAT 7
JOB NO. 17318
PANEL FASTENERS

APPENDIX B

QUALITY ACCEPTANCE CRITERIA CHECKLIST

QUALITY ACCEPTANCE CRITERIA CHECKLIST

(PER FACILITIES ENGINEERING PROCEDURE NO. DES-18)

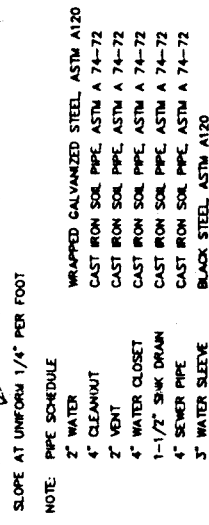
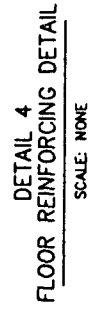
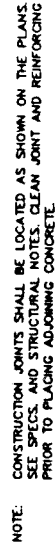
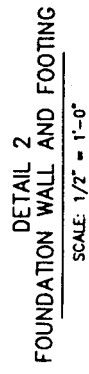
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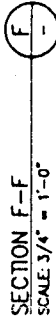
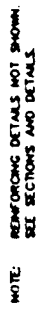
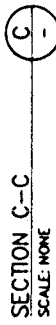
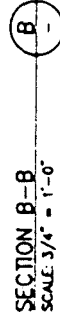
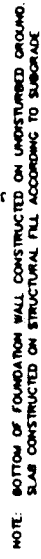
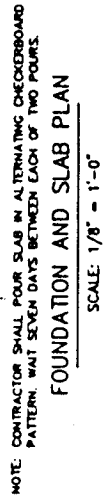
BLDG. 891

JOB TITLE Remedial Action 881 Hillside, 881

ITEM/DESC	ACCEPTANCE CRITERIA	RESP DEPT	DATE COMPLETED	PASS FAIL	INCP INIT	REMARKS
Health Sciences Measures	Sec. 1106 a, c					
Trench Safety	02200-1.2B - OSHA 29CFR 1926 P					
Backfill Compaction	Sec. 02200-3.1F, 3.8 A&B. ASTM-D-698 D-1557, D-1556, D2922					
Concrete Formwork	Sec. 03100-1.3 OSHA 29CFR 1926.701					
Concrete Formwork Design	Sec. 03100-1.3 ACI Standard 347					
Concrete Reinforcement	Sec. 03200-1.3A, 2.1 ACI Standard 315 ASTM A-615, A-185					
Concrete	Sec. 03300-1.4C2, ACI Std. 306, ASTM C-150, C-33, C260, D-1752, D-1751, C-171, C-309 ACI Std. 211.1, 318, 304					
"						
Grout	Sec. 03601-2.1 ASTM-C-150, C-33					

January 13, 1988

[illegible]



NOTE: SUBGRADE PREPARATION:

A. THE FOUNDATION FOOTINGS AND FOUNDATION WALL SHALL BE CONSTRUCTED ON UNDISTURBED GROUND.

B. THE SLAB BENEATH THE SLAB SHALL BE OVERDECATED A MINIMUM OF TWO FEET AND RETELLED TO SLAB GRADE WITH COMPACTED STRUCTURAL FILL SHALL BE COMPACTED TO A MINIMUM OF 95 PERCENT MAXIMUM DENSITY AT OPTIMUM MOISTURE.

A		ORIGINAL ISSUE		BY DATE		DATE		BY DATE		DATE		BY DATE		DATE	
TITLE		DESCRIPTION		BY DATE		DATE		BY DATE		DATE		BY DATE		DATE	
NETWORKS		TOLERANCES		DESIGNED		06/06/98		U.S. DEPARTMENT OF ENERGY		06/11/97		U.S. DEPARTMENT OF ENERGY		06/11/97	
PROJECT 6		HABLE 6		DESIGNED		06/06/98		ROBERT PLATE AREA OFFICE		06/11/97		ROBERT PLATE AREA OFFICE		06/11/97	
DESIGN		5 TURN		DESIGNED		06/07/98		RESEARCH IN INDIANAPOLIS		06/11/97		RESEARCH IN INDIANAPOLIS		06/11/97	
DESIGNED		06/07/98		DESIGNED		06/07/98		ROBERT PLATE PLANT		06/11/97		ROBERT PLATE PLANT		06/11/97	
DESIGNED		06/07/98		DESIGNED		06/07/98		ROBERT SYSTEM GROUP		06/11/97		ROBERT SYSTEM GROUP		06/11/97	
DESIGNED		06/07/98		DESIGNED		06/07/98		GOLDEN COLORADO 8802		06/11/97		GOLDEN COLORADO 8802		06/11/97	
DESIGNED		06/07/98		DESIGNED		06/07/98		Remedial Action 881		06/11/97		Remedial Action 881		06/11/97	
DESIGNED		06/07/98		DESIGNED		06/07/98		Phase 1 Construction		06/11/97		Phase 1 Construction		06/11/97	
DESIGNED		06/07/98		DESIGNED		06/07/98		Foundation Plan and Sections		06/11/97		Foundation Plan and Sections		06/11/97	
DESIGNED		06/07/98		DESIGNED		06/07/98		D 07507-02		06/11/97		D 07507-02		06/11/97	
DESIGNED		06/07/98		DESIGNED		06/07/98		3 of 4		06/11/97		3 of 4		06/11/97	

ENGINEERING-SCIENCE
DESIGN-RESEARCH-PLANNING
STAFF PROJECTS: 1970-1971: 100,000,000 - 100,000,000

COMPUTER GENERATED DRAWING NO MANUAL CHANGES ALLOWED

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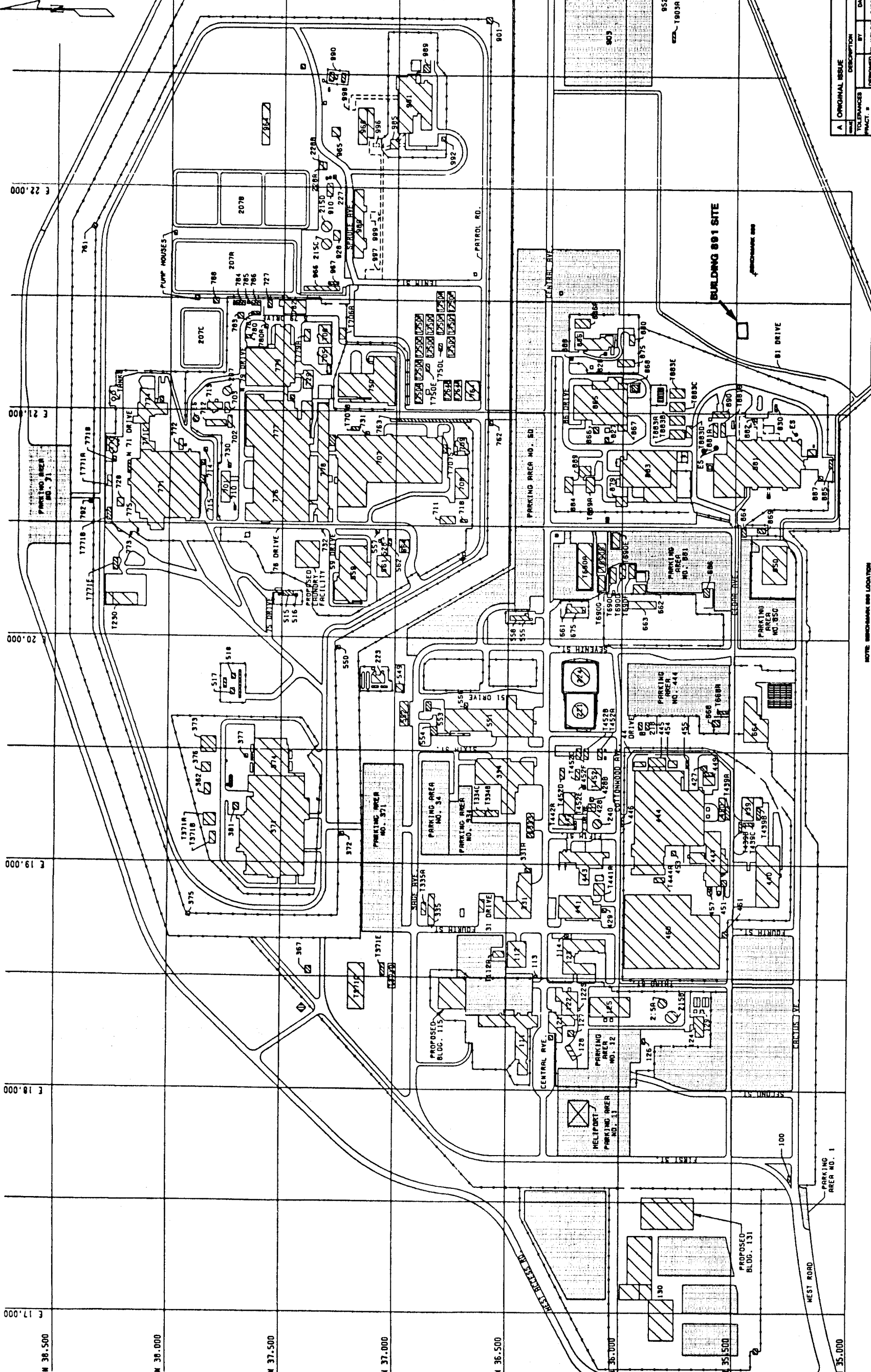
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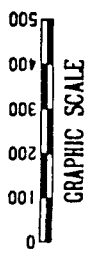
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NORTH



NOTE: BENCHMARK AND LOCATION
PLANT COORDINATES
BY COORDINATES
ELEVATION
REMARKS: SET AS PERMANENT 1/4\"/>

A. ORIGINAL ISSUE		DESCRIPTION		DATE		BY		DATE	
TOLERANCES		DESIGNED	W. KELSO	8/78/88		DATE		8/78/88	
SCALE		CHECKED				DATE			
UNLESS NOTED OTHERWISE		APPROVED				DATE			
REMOVE BARRIERS AND BRAMP EDGES		APPROVED				DATE			
REMARKS		APPROVED				DATE			
AS SHOWN		APPROVED				DATE			